PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Vol. 109, No. 21 Thursday, November 23, 1939 Price Ten Cents

Paper Mills Cooperate on Water Pollution

Ten Manufacturers With Sulphite Mills Discuss Plan To Finance Research Program To Solve Water Pollution In Wisconsin and Fox Rivers —New Low-Rate Plan For Compensation Insurance—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 20, 1939—Ten paper companies owning sulphite mills in Wisconsin will finance a research program aimed at solving the problem of water pollution in the Wisconsin and Fox Rivers, caused by waste sulphite. This decision was reached at a conference at the Institute of Paper Chemistry here November 14, attended by representatives of numerous mills, Dr. C. A. Harper, executive officers of the Wisconsin State Board of Health, Adolph Kannenberg, chairman of the committee on stream pollution, and L. F. Warrick, state sanitary engineer.

Both the mills and health authorities have worked on this problem for years, but reached no definite conclusions except for the reclamation plant built by the Marathon Paper Mills Company, Rothschild, Wis., which Dr. Harper said is about 75 per cent efficient and has demonstrated the conversion of waste to commercial products is profitable. The conference was called to speed up final disposition of the matter. Most cities have built sewage disposal plants, but the mill waste problem remains.

J. M. Conway Presides at Manufacturers Meeting

Manufacturers held a session in the morning, precided over by J. M. Conway, president and general manager of the Hoberg Paper Mills, Inc., Green Bay, at which they discussed the matter among themselves. In the afternoon they met with state officials and arrived at the financing plan for research which will be conducted at the Institute.

Mr. Conway was elected chairman of a committee made up of representatives of the mills participating in the research program. Cola G. Parker, vice-president of Kimberly-Clark Corporation, Neenah, was named financial trustee, and John Strange, secretary of the Institute of Paper Chemistry, as secretary. The mills will select their representatives, and the committee will meet soon, Mr. Conway announced.

The operation and resulting benefits of the Marathon reclamation plant was one of the chief topics of discussion, with the possibility other such plants might be established to serve a similar purpose. State officials expressed themselves well pleased with the cooperation offered by the mills, and felt the program would soon reach the culmination hoped for for some time.

Prominent Paper Men in Attendance

Other paper mill representatives present besides those mentioned were:

F. J. Sensenbrenner, president, and H. G. Boon, general superintendent, Kimberly-Clark Corporation, Neenah; D. C. Everest, president, Marathon Paper Mills Company, Rothschild; Edward Den Dooven, Hoberg Paper Mills, Inc., Green Bay; Earl Murray, president, A. B. Hansen, vice-president and general manager, H. W. Gochnauer, N. L. Malcove, F. J. Timmerman, Northern Paper Mills, Green Bay.

George W. Mead, president, Stanton W. Mead, treasurer and general manager, and R. J. Le Roux, Consolidated Water Power and Paper Company, Wisconsin Rapids; W. A. Munro, president, and Leonard Parkinson, Flambeau Paper Company, Park Falls; Joseph A. Auchter, vice-president and treasurer, T. A. Pascoe and E. P. Gleason, Nekoosa-Edwards Paper Company, Port Edwards; Folke Becker, president, Rhinelander Paper Company, Rhinelander; Fred Motschman, Southern Kraft Corporation, Marinette, and George Hendrick and Charles Di Carlo, Wausau Paper Mills Company, Brokaw.

New Low-Rate For Compensation Insurance

Paper mills which have been self-insured for liability under the Wisconsin workmen's compensation laws will be given an opportunity to carry their insurance with compensation companies under a low rate plan, according to announcement made last week by Morvin Duel, newly appointed state insurance commissioner. The plan will apply only to firms with premiums of $5,000 or more.

By approving a system of retrospective rating, the commissioner has made it possible for employers who have demonstrated a low loss ratio in previous years to buy compensation coverage at reduced rates, thus eliminating many of the advantages of self-insurance which employers of proven financial responsibility are allowed under the law. There are 175 such large employers in the state.

Under the new plan the employer will pay what

(Continued on page 25)

Murdoch Made Member of Abitibi Committee

Vacancy On Independent Committee of Abitibi Power & Paper Co. Caused By Death of Thomas Bradshaw Filled By James Y. Murdoch—Ontario Paper Co. Expands—Dryden Paper Co. Operating At Capacity.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 20, 1939—James Y. Murdoch, of Toronto, President of Noranda Mines, Limited, who is well known in industrial and financial circles, has accepted the position on the independent committee of the Abitibi Power and Paper Company, Limited, Toronto, which was rendered vacant by the death of Thomas Bradshaw last week in Toronto. The committee is now composed of Hon. G. Howard Ferguson, chairman, Hon. George Scott and Mr. Murdoch. In accepting the position it is understood that Mr. Murdoch did so with the feeling that a successful solution of the Abitibi Company would have an important bearing on one of the most important industries of Canada. As Abitibi is a leader in the newsprint group a solution of the problems of the company would doubtless work to the advantage of the industry as a whole. It is pointed out that the interest of Mr. Murdoch in a satisfactory adjustment of the affairs of the Abitibi organization is a reflection of his keen concern for the development of the natural resources of Ontario and the balance of Canada as well as a realization of the improvement in Abitibi matters. Mr. Murdoch is a director of the Mutual Life Assurance Company of Canada and the Bank of Nova Scotia and brings a wide experience to his work with the Abitibi Company.

Ontario Paper Co. Expands Facilities

The Ontario Paper Company, Limited, Thorold, of which A. A. Schmon is president, recently completed a new barking and shipping plant at Heron Bay on the north shore of Lake Superior. The new plant is reported to have cost approximately a million dollars and has been under construction for about a year. The Ontario Paper Company turns out newsprint exclusively for the Chicago Tribune and the New York Daily News. Construction of the new plant which is to obtain its pulpwood supply from the limits of the company in Northwestern Ontario, involved the building of a town site. Prior to the opening of the new plant the company has obtained its wood supply from its own timber limits in Quebec. Limits have been acquired from the province of Ontario on the Black river under an arrangement which obligates the company to cut a minimum of forty thousand cords of wood annually for twenty one years.

Morgan Co. to Make Paper Boxes

The Morgan Paper Company, of which W. H. Morgan is the proprietor, is planning for the manufacture of folding boxes at 929 Dufferin St., Toronto, contingent on an amendment of the residential by-law permitting the erection of the plant to contain approximately 8,000 square feet.

Dryden Co. Operating at Capacity

The Dryden Paper Company, Dryden, Ontario, has been operating at capacity since the first week in September and is reported to be meeting difficulty in filling the requirements of its regular customers. There is a big demand in the middle west for wrapping paper, bags and sheathing paper which comprise the principal products of the company. The price of surplus kraft pulp of which the Dryden Paper Co. has a considerable quantity, has improved materially due largely to the curtailment of supplies from Scandinavia. Last month the fiscal year of the Dryden Paper Company ended and the report for the year will not reflect the improved conditions which have prevailed since last summer. The annual statement will shortly be published and will show earnings slightiy lower than in the previous year but augmented sales demand and higher prices prevailing since the outbreak of the war indicate materially improved conditions for the company.

J. R. Booth Open Toronto Office

J. R. Booth, Limited, Ottawa, have opened an office in Toronto to meet the calls for board turned out by the company. The manager of the new office is Norman Bennett, a son of the late W. P. Bennett who represented the company in Ontario for a long time. The firm of W. P. Bennett & Son is closing down in order that Norman Bennett may look completely after the new position on which he has just entered.

Paper Box Association Open Branch Office

The Canadian Paper Box Manufacturers Association, Toronto, have opened a branch office in Winnipeg, Man., in the Lombard building. The local manager is Donald Williamson.

Provincial Installs New Equipment

Provincial Paper, Limited, recently installed a new coating and drying machine in its plant at Georgetown, Ont. The new machine stretches for about the length of a city block along one side of the coating mill. The new coater and drier can turn out fifty thousand pounds of uniform paper evenly coated on both side without loss of time. The machine which cost $100,000 has been styled the "Watchdog." Older machine types involved a lengthy drying process on "festoon" driers, the stock hanging up on sticks while nature took its drying time. Long standing difficulties under this method were the inequalities in the coated surface known as "stick marks." The difficulties are not present in the new coating and drying method. The coated stock rolls in the maw of the new drier on a straight line, is dried in less than twenty seconds and rolls out on the same straight line. The high speed drying is made possible by controlled steam heat which hits the stock from all directions the second it enters the drying chamber. This heat is at a constant level and is thermostatically controlled along the entire 250 feet of the drier. A revolutionary development is what is called "photo-electric fingers."

These fingers check and record moisture content of coated paper stocks from one end to the other of the new coater and drier of Provincial Paper. Since the original moisture content largely determines uniform reaction to pressroom conditions, it is said that such control will mean much to printers and will ensure good pressroom performance of the new type coated stock. The new equipment necessitated many radical changes in methods and materials. A period of scientific study and testing by the craftsmen of the Provincial organization solved the new problems created by the new machine was responsible for a new coating mixture which could be applied smoothly by the high speed roller method. This coating solution, an important development in itself, gives coated stock even better printing qualities and more consistent color.

Paperboard Men Elect Officers

The annual meeting of the National Paperboard Association was held at the Waldorf-Astoria Hotel, New York, on November 15-16. The meeting was largely attended and one of the most successful in the history of the association. Henry D. Schmidt, of Schmidt & Ault Paper Company, York, Pa., the retiring president, was presented with a solid silver cigarette box, which will be engraved with an appropriate inscription and include the facsimile signatures of all members of the board who served with Mr. Schmidt during the three years he has headed the association.

The following officers were elected:

President, Colonel H. W. Ellerson, Albemarle-Chesapeake Company, Inc., Richmond, Va.; Vice-President, Alan G. Goldsmith, The Mead Corporation, Chillicothe, Ohio; Executive Manager, F. G. Becker, 80 E. Jackson boulevard, Chicago, Ill.; Secretary-Treasurer, H. S. Adler, 80 E. Jackson boulevard, Chicago, Ill.; Secretary, Eastern Div'n, D. A. Sealey, 40 E. 41st street, New York City; Statistician, Grafton Whiting, 80 E. Jackson boulevard, Chicago, Ill.

The directors elected for the ensuing year were as follows:

Eastern Container Board: Geo. E. Dyke, Robert Gair Company, New York, N. Y.; Alan G. Goldsmith, Mead Corporation, Chillicothe, O.; D. F. Lawless, Lawless Brothers Paper Mills, E. Rochester, N. Y.

Western Container Board: Marcus B. Hall, American Box Board Company, Grand Rapids, Mich.; Walter P. Paepcke, Container Corporation of America, Chicago, Ill.; Hugh Strange, John Strange Paper Company, Menasha, Wis.

Southern Container Board: Alexander Calder, Union Bag and Paper Company, New York, N. Y.; R. J. Cullen, Southern Kraft Corporation, New York, N. Y.; H. W. Ellerson, Albermarle-Chesapeake Company, Richmond, Va.; C. W. Gaylord, Gaylord Container Corporation, St. Louis, Mo.; Fred E. Hummel, Hummel-Ross Fibre Corporation, Hopewell, Va.; S. M. Phelan, Jr., West Virginia Pulp and Paper Company, New York, N. Y.

Eastern Boxboard: Geo. W. Mabee, National Folding Box Company, New Haven, Conn.; W. G. Shortess, Federal Paper Board Company, Bogota, N. J.; W. S. Stuhr, United Paperboard Company, New York, N. Y.

Western Boxboard: E. T. Gardner, Gardner-Richardson Company, Middletown, O.; F. M. Lebold, Morris Paper Mills, Chicago, Ill.; W. I. Osborne, Jr., Cornell Wood Products Company, Chicago, Ill.

Corrugating Material: C. D. Altick, Terre Haute Paper Company, Dayton, Ohio; H. T. Cherry, Central Fibre Products Company, Tama, Iowa; Sidney Frohman, Hinde & Dauch Paper Company, Sandusky, Ohio.

Pacific Coast: John W. Kieckhefer, Kieckhefer Container Company, Milwaukee, Wis.; D. H. Patterson, Jr., Fibreboard Products, Inc., San Francisco, Cal.; C. J. Schoo, Longview Fibre Company, Springfield, Mass.

Lightweight Chipboard & Bogus: H. J. Finder, Prairie State Paper Mills, Joliet, Ill.; J. E. Kieffer, Kieffer Paper Mills, Ewing, Ind.; H. D. Schmidt, Schmidt & Ault Paper Mills, York, Pa.

Directors At Large Elected by Membership: W. J. Alford, Jr., Continental Paper Company, Ridgefield Park, N. J.; W. G. Latham, Fort Orange Paper Company, Castleton-on-Hudson, N. Y.; C. E. Nelson, Mac Sim Bar Paper Company, Otsego, Mich.; G. G. Otto, Alton Box Board Company, Alton, Ill.

National Coated Paper Corp. Sold

The assets of the National Coated Paper Corporation, Pawtucket, R. I., whose plant was shut down recently because of receivership proceedings have been purchased by the Narragansett Paper Corporation, a newly formed corporation. Attorney Morriss S. Waldman, the receiver, effected the sale under authority given him by Presiding Justice Jeremiah E. O'Connell of Superior Court.

Papers filed in the office of the Secretary of State showed the new corporation comprises Nicholas B. Young of 23 Seventh street, East Providence; Dwight L. Browning of 328 Lonsdale avenue, Pawtucket, and Percy W. Gardner, a Providence attorney.

Mr. Young, who was vice president of the old firm, is treasurer of the new corporation. Mr. Browning has been a salesman for the plant for a number of years.

No higher bids having been received, the plant was sold by Mr. Waldman to the new corporation for $9000, the amount of its offer, subject to the $21,000 mortgage held by Mr. Young's mother, Mrs. Harriet B. Young of East Providence.

Penn Fibreboard To Resume

YORK, Pa., November 20, 1939—The former Penn Fibreboard Company's plant, Mt. Rose avenue and the Maryland and Pennsylvania railroad, now owned by the Southern Kraft Corporation, will resume operation it was announced last week. The plant was purchased twenty-two months ago by Southern Kraft corporation and has been leased since that time for the storage of wood pulp. Fibreboard and similar products will be manufactured when it reopens.

Carl Creiger, formerly with the Penn Fibreboard, is in charge of the work of reconditioning the mill for operations. When the Southern Kraft purchased the plant from the Penn Fibreboard Company, the machinery was preserved and it will require only a limited time to place the mill in readiness for the manufacture of its former products.

The Southern Kraft Company operates a mill in York Haven and it was said the increased business received by the company necessitated the opening of the closed plant at York.

Strong Demand Reported by Chicago Trade

Current High Level of Paper Sales Attributed To General Business Improvement Shows No Sign of Receding—Champion and Riegel Mills To Supply Milk Container Paper — Container Improvements Under Way.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 20, 1939—Despite the absence of hostile news from the "front pages," the Chicago paper market gives signs of additional strengthening which is offered by local executives as proof that the "boom" is definitely traceable to general business improvement. Demand continues to show no signs of receding from the "normalcy" which developed after the initial hysteria wore away.

As long as the European situation continues to influence the pulp market, strength is expected in the general picture. Specifically, there are reports that the forward movements in some lines, including sulphites, may continue within the next few weeks as underlying strength increases. Krafts are strong with demand reported good in virtually all quarters. Books and covers show strength with recent price revisions all indicating a general upward trend. Bonds and ledgers, as a class, are in good demand. Groundwoods and newsprints are likewise reported in a sound position. In virtually all instances, mills are reported to have made substantial inroads in their back log with an orderly market procedure expected now and for some months to come. Waste papers, particularly the higher grades, continue to show strength reflecting the general situation in raw materials.

Container Corp. Improvements Under Way

An improvement program at the Ogden Avenue paper mill of the Container Corporation of America is progressing rapidly according to announcements made by W. P. Paepcke, president of the company. A total of $250,000 will be spent to include a large capacity steam boiler to supplement existing facilities and permit the mill to operate at extremely high pressures. A water treating system will also be included as well as material additions to floor space. Eventually, the company expects to obtain new turbines and institute additional improvements in paper making methods designed to reduce costs and increase production.

Champion and Riegel to Supply Container Stock

As the Chicago glass versus paper container war reaches its termination with victory for the paper container in sight, the news has spread that the American Can Company is going into production of a two quart single service milk container that will save the consumer as much as 3 cents on his milk purchases. It is understood that the paper for the containers is to be purchased from the Champion Paper and Fibre Company and the Riegel Paper Corporation and that it will have attributes of durability and sanitation which will make the distribution of milk in paper containers a most popular move—coupled, as it will be, with possible lower prices.

Puchasing Agents Hold Meeting

The eleventh annual meeting and exhibition of the Purchasing Agents of Chicago is one of the highlight events of the week. The 1939 Products Exposition was held at the Hotel Sherman on November 15 and 16 with purchasing agents from Illinois and a number of neighboring States on hand for the program. Donald McGibeney and Cornelius Vanderbilt, Jr., were featured speakers on a program which had for its theme "What Is New In Industry." Included in the group of exhibitors were the Acorn Corrugated Box Company, Chicago Belting Company, Heco Envelope Company, Hinde & Dauch Paper Company, Link-Belt Company, Schwarz Paper Company and Tallman Robbins Company. Each of these had comprehensive exhibits of new products of interest to the purchasing agents of midwest concerns.

Indianapolis Demand Fair

INDIANAPOLIS, Ind., November 20, 1939—Normal business featured the local paper market during the last week. The volume was fair and an increasing number of inquiries leads to the belief that business will hold firm until the first of the year. In the fine paper field there was some business, but it was not as high as it was a couple of months ago. Local jobbers say their warehouse stocks now are in better shape than they were and the temporary difficulty they had a while back in securing stocks from the mills seems to have passed. Prices on sulphites, and other grades of fine paper are firm and nothing now can be seen to indicate any great fluctuation in the market. Every attempt is being made locally to keep the fine paper situation on an even keel.

Demand for newsprint, particularly from the smaller communities, has shown a slight increase during the last week. Indiana celebrates an early Thanksgiving and domestic lineage in these papers has improved due to Holiday advertising. Immediately after next Thursday, papers in all part of the state are expecting a big increase in lineage. Indiana merchants begin advertising Christmas merchandising immediately after Thanksgiving.

Building paper and roofing have slumped materially in the last two weeks. The volume of late fall building has not been as large as was predicted late in the summer. This was not due to bad weather, for the state has had no really cold weather. Jobbers report most dealers with well balanced stocks and they are expecting little business until after inventory.

Most local container factories are working nearly at full production, though no extra shifts have been added. Demand in most lines is better than it was a year ago. Strictly holiday merchandise is moving rapidly, with toy manufacturers and the confectionery trade being particularly active.

A trifle better market is reported for rags and waste paper, with prices on the former somewhat higher and prices for paper holding steady. No change was reported on prices of low grades of paper stock.

Financial News of Pulp and Paper Industry

West Virginia Pulp and Paper Company Reports Greatly Increased Profits — To Redeem First Mortgage Bonds — Mead Corporation Earnings Rise — Container Corp. of America and Subsidiaries Show Profit.

New York Stock Exchange

High, Low and Last for the Week Ending November 22, 1939

	High	Low	Last
A. P. W.	2½	2⅛	2⅛
Armstrong Cork Co.	40	38	39½
Celotex Corp.	11¼	10½	11
Celotex Corp., pf.	60¼	60	60¼
Certain-Teed Products Corp.	7⅝	7	7⅛
Certain-Teed Products Corp., pf.	36⅛	33½	33⅛
Champion Paper & Fibre Co.	26¼	25¼	25⅛
Champion Paper & Fibre Co., pf.	101½	100	101½
Congoleum-Nairn Co.	25¼	23¾	25¼
Container Corp. of America	16¾	15⅞	15⅞
Continental-Diamond Fibre Co.	8¼	7¾	7¾
Crown-Zellerbach Co.	16¾	15⅜	15⅜
Crown-Zellerbach Co., pf.	89½	88	88
Flintkote Co.	22⅜	20½	21⅞
Robert Gair	4⅝	4¼	4¼
Robert Gair, pf.	17⅝	16	16¾
International Paper & Power	13¼	12½	13
International Paper & Power, pf.	50¾	48⅜	49¼
Johns-Manville Corp.	77¼	75	75
Kimberly Clark Corp.	35½	35	35½
MacAndrews & Forbes	31	30¼	30⅞
MacAndrews & Forbes, pf.	135	135	135
Masonite Corp.	40¼	36¾	40
Mead Corp.	11⅝	10½	10½
Mead Corp., pf.	72	71½	71½
Paraffine Companies, Inc.	45½	44½	45⅛
Paraffine Companies, Inc., pf.	98½	98½	98½
Rayonier, Inc.	16	16	16
Rayonier, Inc., pf.	25⅞	25⅞	25⅞
Ruberoid Co.	21⅜	20½	20⅞
Scott Paper Co.	49	48¼	49
Scott Paper Co., pf.	114½	114	114½
Sutherland Paper Co.	29½	28¾	29½
Union Bag & Paper Corp.	11¾	11¼	11¼
United Paperboard Co.	6¼	6⅛	6⅛
U. S. Gypsum Co.	85⅞	82½	82½

New York Curb Exchange

High, Low and Last for the Week Ending November 22, 1939

	High	Low	Last
American Box Board Co.	9	7⅞	9
Brown Co., pf.	21	21	21
Great Northern Paper	45	43	43½
St. Regis Paper Co.	3⅛	2⅞	2⅞
St. Regis Paper Co., pf.	53	53	53
Taggart Corp.	4⅞	4½	4¾

West Virginia Earns $2.57 Per Share

The West Virginia Pulp and Paper Company in the last quarter of its fiscal year, which ended October 31, 1939, resulted in a net profit for the period which was greater than the total earnings for the preceding nine months. Then the company had earnings of $400,289 which were equal to $2.57 a share on the 155,830 preferred shares, in comparison with only $231,782 in the like period of the preceding years. The preferred stock requires nearly $935,000 annually in dividends, which probably were fully covered in the fiscal year. In the previous year West Virginia earned $260,353, which was equal to only $1.67 a share on the preferred stock.

Sales by the company spurted quite sharply in the final quarter of the year, and total sales of paper by the company were approximately 392,000 tons, the greatest total for the company in any one year. The previous peak came in 1937, when sales of all paper amounted to 328,080 tons. In the first nine months of the last fiscal year the company sold 272,000 tons of paper. Approximate sales for the final three months were 35,000 tons in August, 39,000 tons in September and 45,000 tons in October.

West Virginia Pulp & Paper Co. on July 31, 1939, had total current assets of $17,627,164, which included $6,344,253 of cash. Current liabilities were only $1,395,190. At that time there were outstanding $9,601,000 of first mortgage 4½% bonds, 155,830 shares of 6% cumulative preferred stock and 902,432 common shares.

With roughly 440,000 tons annual capacity at its various mills, the total is divided approximately half and half between white or book papers and kraft paper and board.

West Virginia To Redeem Bonds

WASHINGTON, D. C., Nov. 22, 1939—West Virginia Pulp and Paper Company has filed a registration statement under the Securities Act of 1933 with the Securities and Exchange Commission covering $8,000,000 of 3 per cent First Mortgage Bonds, due December 1, 1954.

The net proceeds from the sale of the Bonds, together with additional corporate funds, will be applied to the redemption on or about February 7, 1940, of $9,268,000 principal amount of 4½ per cent First Mortgage Bonds, due 1952. The total amount of funds required for the redemption, including principal and premium but not including interest, is $9,731,400.

Harriman, Ripley & Co., Incorporated of New York City will be the principal underwriter. The names of the other underwriters, the offering price of the Bonds, together with underwriting discounts or commissions, and the redemption provisions will be filed by amendment.

The Bonds will be entitled to the benefits of a sinking fund, requiring the retirement of $215,000 principal amount of the Bonds by December 1, 1940, and progressively increasing amounts annually thereafter, calculated to retire 50 percent of the Bonds by maturity. Payments into the sinking fund are to be made on October 15 in each year.

To facilitate the offering, the prospectus states that it is intended to stabilize the price of the Bonds.

Mead Corp. Nets $246,517

The Mead Corporation and subsidiaries report for the forty weeks to Oct. 7 a net profit of $246,517, equal to $3.04 each on combined 31,935 shares of $6 preferred and 49,200 shares of $5.50 preferred stocks. This compared with $22,999, or 28 cents a share on combined preferred stocks in the forty weeks to Oct. 1, 1938. Sixteen weeks to Oct. 7: Net profit, $89,297, or $1.10 a share, contrasted with net loss of $194,460 in the sixteen weeks to Oct. 1, 1938.

Container Corp. Nets $632,093

The Container Corporation of America and subsidiaries for the ten months ended Oct. 31, report a net profit of $632,098, equivalent to 81 cents each on 781,253 share of common stock, against net loss of $62,662 last year.

Forestry and the Railroads

By Charles A. Gillett[1]

As the forests are transformed into useful materials and money, the vibration of the mills is the pulse of a great heart that forces a vitalizing stream of blood through innumerable business channels through whose tills and cash boxes the forest payrolls pass. To keep this pulse beating depends upon a continuing supply of forest resources. The importance of the forests, particularly in the South, has been brought to the front during recent years because of a widespread yet healthy demand for wood by pulp mills and general talk and publicity about additional mills. Increased utilization in the South has greatly stimulated interest and activity looking toward the maintenance and building up of forest productivity to assure an adequate supply of timber for all domestic and industrial purposes.

Great Potential Value of Southern Forests

Probably no area of similar size in the entire world was endowed with forests of greater potential value than the States of the South. Originally, practically the entire land area of the South was forest covered. These original areas of forests have, however, been reduced by land clearing and cutting so that today only a small fraction is the original growth and the present forest area is primarily second growth. Forests must now be grown as crops if communities, industries and individuals are to be sustained. In the States of Alabama, Florida, Georgia, North and South Carolina and Virginia, approximately 267,000 persons are directly dependent upon forest industries for employment. On the basis of five dependents to each employee there are over 1,300,000 persons in the six States above mentioned who are dependent upon the operations of mills looking to the forest as a source of raw materials.

Railroads are progressive institutions and are vitally concerned with the perpetuation of forest growth. Some railroads have had forestry departments or foresters on their staffs for years. In most cases, however, these foresters have had to do with the handling of railroad lands and in many cases in the handling of purchases of forest products. The program of the Seaboard Air Line Railway is unique, however, in that it is directed towards stimulating a widespread interest on the part of private forest owners, large and small, in growing timber as a crop for the purpose of making the territory it serves a permanent source of timber for all existing wood-using industries and to assure prospective industries of continuous supplies of their necessary raw materials.

Forest Produces Important Tonnage

It would be foolish to say that the railroads' interest in forestry did not include tonnage. Forest products tonnage in the past has been an important part of their revenue. The following table shows for the past ten years the number of carloads of forest products moved by railroads of the South, with a total mileage of 38,741, and the percentage of carloads of forest products to the total carload shipments.

[1] Industrial Forester Seaboard Air Line, Railway, Norfolk, Va.

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

—Southern District—
1929 to 1938—Inclusive

Year	Carload Shipments *	Forest Products	Per cent Forest Products of Carload Shipments
1929	5,409,412	1,008,542	18.6
1930	4,644,345	714,785	15.4
1931	3,718,342	465,470	12.5
1932	2,697,520	296,494	11.0
1933	2,884,158	341,038	11.8
1934	3,007,633	334,250	11.1
1935	3,175,274	401,222	12.6
1936	3,704,914	487,422	13.2
1937	3,921,709	571,224	14.6
1938	3,338,444	451,862	13.5

* Excluding merchandise, L.C.L.

Present Tonnage From Second Growth

Originally forest products tonnage resulted from the liquidation of virgin forest growth. Practically all of the present tonnage is from second growth forests. Continued expansion of forest products tonnage is practical and entirely possible, but only as long as timber is grown in sufficient amounts to maintain justifiable increases. An active program of promotion and encouragement of timber growing, according to approved practices, is of prime importance, not only directly from the standpoint of movement of forest raw materials and their products of manufacture but from the standpoint of employment resulting therefrom. When we have employment, we have happier homes and happier communities. Railroads are spending hundreds of thousands of dollars annually to aid in agricultural development, to bring about a balanced and well rounded industrial development, and now to bring about proper forestry development to the end that employment and thriving communities may result.

Railroads are not only interested in pulp mills but all industries dependent upon the forests for raw materials. Fortunately forests do not produce only one size or quality of trees but a wide variety of different forms, sizes and species. Different products by proper forest management can, therefore, be obtained from the same forest area. Pulpwood is a natural by-product of the forest since a great deal of it can be obtained incidental to growing trees of sawlog size or pole size. To grow timber profitably it must be cut and proper cutting favors rapid growth of quality trees for the final crop. Excellent opportunities are present for pulpwood companies to work out exchange agreements for the integrated utilization of their forests. Creosoting companies and others can do likewise to mutual advantage.

Protection of Forests Against Fires

A progressive railroad operating in forested territory will recognize that the protection of forests against fire is the first and foremost requirement of growing timber under any degree of intensity. The condition of restocking on many stands of forest is due primarily to uncontrolled forest fires in the past. The protection of forests against fire, however, is primarily a public one and the progress of fire protection has been handicapped by lack of adequate public financing. Railroads as a whole can be of

material help in presenting forest facts to fund appropriating authorities as an aid in helping to secure the necessary public appropriations. In addition to the above, the Seaboard's forestry program contemplates cooperating with proper agencies in carrying out a number of country-wide educational campaigns against the forest's greatest enemy—fire. These campaigns will put into effect such methods as exhibits, new stories, essay and other contests, as well as visual instruction meetings, to the end that timberland owners and others will make voluntary pledges against woods burning and further pledge assistance in actual fire suppression.

It may be roughly estimated that with complete fire protection, timber lands over an extended area will approximately double their growth over unprotected areas. With a program of forest management or applying the same principles to forests that one would to secure maximum production from a field of cotton, corn, or tobacco, these same timber lands should triple or quadruple their growth.

Problem to Produce Continuous Crop

The problem then, in a nut shell, is to handle timber lands so that they will produce repeated crops of timber at the shortest intervals or handle them so that they will produce a continuous crop. While many owners are handling their forest according to sound forestry principles, yet the majority have not learned the advantages of timber cropping. Lumber companies, pulp companies and others have learned that it is now practicable and desirable from a business standpoint to manage timber for frequent repeated harvests from the same lands. They have learned that frequent light cuts in growing forests greatly increase their productivity by preventing crowding and by allowing the owners, instead of nature, to determine which trees will be allowed to mature. Thus, quality timber products are produced in a minimum of time with substantial amounts of by-products, such as pulpwood, being produced by frequent thinnings. The forest management problem is intensified because of the many small ownerships of forest areas. It will require proper handling of these small wooded tracts if the maximum amount of wood is to be grown. If these smaller owners learn the advantage of growing timber crops and apply protective and proper cutting practices, the South will be able to supply a vastly larger group of wood-using industries than it does at present. The problem of forest management, in which the railroads are interested, is to bring the tremendous acreage of productive forests under some satisfactory form of forest management. The railroads can be of assistance in helping to coordinate the timber growing policies of all forms of forest land owners. The Seaboard's forestry program contemplates personal advice and assistance to forest owners on the best methods of handling their properties, including the most practical forest measures consistent with their particular operations. It is likewise important to encourage industries now buying their timber requirements to acquire their own timberlands when it appears feasible and to grow a considerable portion of their needs, thereby insuring themselves of a continuous supply of raw material. Proper forest management on private lands can best be brought about by educational efforts. This will require the coordinated efforts of public foresters and industrial foresters. In addition to personal services, the Seaboard's forestry program contemplates bringing about changes in practices through means of demonstrations and other extension methods.

More Wood-Using Industries

In the South, more wood-using industries are needed. Timber growing will be intensified only to the extent that there are markets for the timber grown. The more opportunity there is to sell wood in various forms and to utilize completely all trees and portions thereof, the more incentive there is for forest owners, large and small, to cultivate tree crops by the practice of comparatively simple forestry measures.

It is not uncommon for well stocked stands to grow one cord per acre per year. Through forest protection and proper management much of the understocked stands can, in time, be raised to this capacity. Forest protection and forest management will reduce the annual drain of forest products by mortality and increase the net increment materially. We may conservatively say that under such conditions we could at least double the number of present industries from a timber standpoint. At the present time, in most cases, forest practices are ahead of industrial development. More pulp mills should be located at strategic points to utilize the products which up to the present time have not had a market and to use through improvement cuttings, trees which in the natural growth to saw-logs would die.

More Forestry Essential

With increased utilization, more forestry is essential and likewise the more forestry the more plants that can be supported within the productive limits of the forest soils.

The saturation point in wood utilization in all of its forms is far from reached insofar as wood supply is concerned.

The Railroads are interested in forestry.

Paper & Cordage Men Nominate

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 20, 1939—The Philadelphia Paper and Cordage Association held its regular monthly meeting in its new headquarters, the Arcadia Restaurant, on last November 17. The annual Christmas party of the Association will be held in the English Room of the Arcadia at noon on Tuesday, December 19th. As has been the custom throughout the years, the Association will entertain sixty poor children, recruited from the ranks of the Salvation Army, presenting each boy and girl with sweaters, caps, gloves, mufflers, skates, books and toys. E. K. Lay, former president of the Association, and now chairman of the Entertainment Committee, states that the program promises to be one of the best yet presented.

The Nomination Committee presented a list of candidates for the election, which takes place at this time of the year, and the following names will appear on the ballots as potential officers for 1940: George K. Hooper, president; Joseph H. Miller, vice-president; Everett Hoffman, treasurer; F. M. Kurz, secretary.

There will be six directors chosen from a slate of eleven names proposed by the committee as follows: Carroll Gardner, Fred Brower, Arthur Sherrill, Fred Hastings, David Wickersham, E. K. Lay, John Heberly, Frank Hufnal, E. L. Richards, J. R. Howarth and Jack Shinners.

Boston Paper Men Meet

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 20, 1939—Six new members were elected at the fall meeting and dinner of the Boston Paper Trade Association, held Wednesday evening, November 15, at the Exchange Club, and featured by an address by Harrison Forman on "Poland Aflame," accompanied by both still and moving pictures. President John L. Hobson was in the chair, with an attendance of approximately 135.

After the torch was applied to the fragrant weed, Mr. Hobson called the meeting to order, complimenting Lindsay Cummings for his success as sing leader of the evening.

New Members Elected

The following new members were elected: Stanwood H. Cook, Haverhill Boxboards, Inc., Haverhill, Mass. (limited membership); Ralph H. Morrill, vice-president and general manager, Chemical Paper Manufacturing Company, Holyoke, Mass. (regular membership); Robert C. Clark, vice-president, Eastern Corporation, Bangor, Me. (regular); Edward M. Graham, president, Eastern Corporation (regular); A. J. Sottung, Byron Weston Company, Dalton, Mass. (limited), and John Calligan (limited), Eastern Corporation, Boston.

President Hobson appointed the following members of the nominating committee: Charles L. Proctor, chairman, John E. A. Hussey, John Vivian, M. L. Madden and Jesse G. Swift.

Those In Attendance

Those present at the meeting included: the following: William Ross, F. Henry Savage, W. E. Porter, Jr., F. F. Burkhardt, J. W. Driver, F. W. Main, Carl F. Werner, Chas. E. Beatty, H. C. Fowler, J. H. Calligan, C. E. Rice, L. B. Mathers, Edward H. Sussenguth, F. G. Lockwood, E. E. Lanagan, R. L. Day, Russell S. Madden, L. McCurdy, J. H. Sweet, N. S. Clark, Jack Mathers, Paul M. Beach, F. Bendel Tracy, E. E. Ketcham, R. C. Adams, Howard Chase, Leon Cheever Young, E. W. Beal, E. Cullinane, John Roach, A. M. Middleton, D. C. Cheever, Jr., J. G. Swift, D. P. Abercrombie, Jr., Arnold D. Jenkins, E. T. Simpson, A. J. Evitts, J. R. Halkyard, C. W. Townsend, Hubert W. Lockhart, C. W. Nelson, E. P. Clausmeyer, J. R. Cryan, H. J. Bourger, H. B. Robertson, Francis Halloran, Charles J. O'Brien, Bill Collins, C. H. Dodge, W. H. Loud, Louis T. Stevenson, James J. Dwyer, Arthur W. Frank, Edgar P. Hay, Lewis L. Claflin, Warren W. Young, C. O. Edgerly, C. Frederic Wellington, W. E. Doble, Walter M. Pratt, Walter P. Simonds, H. R. Woodward, H. C. Thayer, J. E. A. Hussey, S. W. Bartlett, Irving N. Esleeck, Charles S. Proctor, James R. Carter, Hubert L. Carter, T. K. Davis, K. H. Ways, J. P. Ingalls, Joseph L. Levis, Paul B. Fraser, Ernest C. Calkin, Clifford H. Harris, M. O. Byrne, Charles A. Shaw, H. A. Lindenberg, Earl S. Clark, J. J. O'Brien, E. L. Cummings, F. B. Cummings, Grant Richardson, Fred B. Korbel, W. N. Stetson, Jr., E. L. Wood, H. M. Donahue, John G. Clark, Constant Southworth, Harold A. Allen, John R. Whitney, Ted Bracken, Joseph D. Starr, Jr., Norman Kimball, Walker B. Holmes, Ralph H. Morrill, Arthur M. Burr, John Munro, Ted Lyman, Ralph P. Robinson, C. W. Harvey, W. W. Newton, F. H. Masselink, E. D. Bement, F. H. Blackman, N. Ransom, Carl Kenton, R. F. Piper, R. O'Neil, Stanwood H. Cook, Charles W. Fields, Ralph B. Case, Ray Wight, F. D. Hatch, Frank H. Winter, Wm. J. McLellan, Arthur F. Fay, John Kelley, A. T. Carter, E. W. MacDonald, Wm. C. Ross, Roger P. Teele, W. Gardner Very, G. T. Singleton, Hartley A. Hurlbert, Allan I. Hatfield, R. M. Stone, J. L. Hobson, J. H. Brewer, and T. C. Casey.

Officers of the association are: President, John L. Hobson; First Vice-President, Robert M. Stone; Second Vice-President, Irving N. Esleeck; Treasurer, T. Charles Casey; Secretary, John H. Brewer.

Pacific TAPPI Meets

The Pacific Section of the Technical Association of the Pulp and Paper Industry met in Camas, Wash. November 7, 1939, to enjoy the second in the series of monthly dinner programs arranged by F. A. Olmsted, Vice-Chairman.

The program included a paper by W. W. Offner, electrical engineer, Industrial X-Ray Laboratories, of Seattle entitled "X-Ray Examination of Equipment." His talk was illustrated with slides and a small x-ray machine demonstrated how internal damage to installed equipment may be determined.

Harry G. Specht, Vice-President and General Manager of the Eastwood-Nealley Corporation, Belleville, N. J., spoke on "Paper Machine Wires." A sound film "Packaging, a Public Service" showed the value of modern packaging, particularly of foods, to the life of the average man. Among those present were:

C. E. Ackley, C. A. Anderson, G. A. Atkins, Lee C. Baltzelle, C. T. Beals, C. H. Belvin, John E. Brown, Thomas F. Buford, John M. Carlson, J. E. Cater, G. W. Charters, R. E. Chase, Claud Christiansen, William W. Clarke, N. W. Coster, H. W. Dassel, Howard J. Ells, Clarence Enghouse, A. E. Erickson, Carl Fahlstrom, M. J. Franklin, J. D. Fraser, J. P. Foley, C. F. Gaiser, Howard Graham, T. H. Grant, R. B. Haight, H. R. Heuer, W. S. Hodges, C. F. Holcomb, George Horton, J. H. Hull, W. C. Jacoby, Jack E. Johnson, L. T. Johnson, W. A. Kelly, J. B. Knight, Jr., John A. Liedtke, Gustaf A. Lorenz, Dorsey E. Lowther, A. H. Lundberg, William P. Luthy, Robert W. Martig, Leland F. Maybach, B. T. McBain, J. H. McCarthy, C. R. McCully, L. D. McGlothlin, George H. McGregor, A. M. Mears, O. Michaelis, G. F. Mitchel, P. Millard, A. G. Natwick, George Nelson, Austin Nickels, M. Norwood, Walter W. Offner, F. A. Olmsted, Frederic M. Pape, H. Prelinger, E. D. Rich, H. L. Rudow, S. A. Salmonson, W. A. Salmonson, F. V. Sams, B. W. Sawyer, Brian Shera, C. Sholderbrand, A. P. Siebers, Fred R. Sievers, Herman N. Simpson, Harry G. Specht, L. E. Stevenson, Franz Sturm, F. F. Sullivan, A. Ward Tedrow, J. M. Tedford, E. H. Tidland, V. L. Tipka, Cecil L. Triplett, Bernhardt Weidenbaum, Fred Weleber, Rex L. West, S. E. Wightman, A. D. Wood, Edward P. Wood, Herbert H. Wymore.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 22, 1939—Barton, Duer & Koch Paper Company has been awarded the contract for furnishing the Government Printing Office with 33,649 pounds (253,000 sheets) of 25 x 35½ white sulphite ledger paper at 6.14 cents, bids for which were received on October 30.

R. P. Andrews Paper Company will furnish 5,900 pounds (25,000 sheets) of 26 x 38 high finish sulphite manila tag board at 5.8 cents. Barton, Duer & Koch Paper Company will furnish 7,500 pounds of 25 x 34" No. 1 binders board at 4.077 cents. Bids for both of these items were received on October 27.

Barton, Duer & Koch Paper Company will furnish 10,000 pounds (116,000 sheets) of 21 x 32, 50 per cent rag, white ledger paper at 10.7 cents, bids for which were received on October 25.

Old Dominion Paper Company will furnish 399,925 pounds (1,882,000 sheets) of 25 per cent rag, 39 x 51 white bond paper at 7.979 cents and the Marquette Paper Company will furnish 72,000 pounds (1,000,000 sheets) of 21 x 32" white sulphite bond paper at 5.645 cents. Bids for both of these items were received on October 23.

Mudge Paper Company will furnish 6,250 pounds (50,000 sheets) of 50 percent rag, 20 x 25 blue antique cover paper at 9.48 cents, bids for which were received on October 16.

Paper Corporation of the U. S. will furnish 80,000 pounds of newsprint paper in 24 inch and 36 inch rolls at 3.4 cents. Mudge Paper Company will furnish 9,514 pounds (67,000 sheets) of 33 x 51 white M.F. book paper at 5.54 cents and Barton, Duer & Koch Paper Company will furnish 14,800 pounds (100,000 sheets) of 50 per cent rag, 26 x 38 lithograph finish map paper at 10.45 cents. Bids for these items were received on October 13.

Government Printing Office has received the following bids for 104,700 pounds (600,000 sheets) of 34 x 48 white sulphite bond paper; Barton, Duer & Koch Paper Company, 5.95 cents; Whitaker Paper Company, 6.54 cents; Stanford Paper Company, 6.5 cents; R. P. Andrews Paper Company, 5.94 cents; Marquette Paper Company, 5.645 cents; Graham Paper Company, 6.12 cents; Aetna Paper Company, 6.2 cents; Old Dominion Paper Company, 5.894 cents; and Mudge Paper Company, 5.96 cents.

For 5,000 pounds No. 1 gummed kraft paper in 24 inch rolls; Whitaker Paper Company, 8.9 cents; Mathers-Lamm Paper Company, 8.75 cents; R. P. Andrews Paper Company, 9.29 cents; Mudge Paper Company, 7.1 cents; Cauthorne Paper Company, 8.88 cents; Resolute Paper Products Corp., 8.75 cents less 2 per cent; Enterprise Paper Company, 8.74 cents less 2 per cent; Andrews Paper House of York, 9 cents; and Barton, Duer & Koch Paper Company, 8.95 cents.

For 42,250 pounds (250,000 sheets) of 28 x 41 dull coated book paper; Stanford Paper Company, 6.97 cents; Whitaker Paper Company, 7.25 cents; Barton, Duer & Koch Paper Company, 7.19 cents; and Mudge Paper Company, 7.5 cents.

For 28,050 pounds (300,000 sheets) of 32 x 42 pink sulphite writing paper; R. P. Andrews Paper Company, 8.24 cents; Barton, Duer & Koch Paper Company, 6.79 cents; Marquette Paper Company, 6.98 cents; Aetna Paper Company, 6.69 cents; Stanford Paper Company, 8.5 cents; Mudge Paper Company, 7.91 cents; and Mathers-Lamm Paper Company, 7.98 cents.

For 233,544 pounds (877,870 sheets) of 37 x 47½, 50 per cent rag, white ledger paper; Baxter Paper Company, 9.97 cents; Mudge Paper Company, 10.23 cents; Barton, Duer & Koch Paper Company, 10.37 cents; R. P. Andrews Paper Company, 11.63 cents; Stanford Paper Company, 10.05 cents; Paper Corp. of U. S., 10.53 cents; Aetna Paper Company, 10.97 cents; and Mathers-Lamm Paper Company, 11.35 cents.

For 160,000 pounds (1,000,000 sheets) of 34 x 44 white sulphite bond paper; Barton, Duer & Koch Paper Company, 5.96 cents; Mudge Paper Company, 5.96; Stanford Paper Company, 6.25 cents; R. P. Andrews Paper Company, 5.96 cents; and Marquette Paper Company, 5.72 cents.

To Make Castings for Prosperity Co.

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., November 20, 1939—Announcement is made here that the Bagley & Sewall Company has contracted to produce castings and also other work for the Prosperity Company of Syracuse. The local concern manufactures pulp-making machinery, pulp screens, vices and power pumps on an extensive scale. The new contract will mean approximately $50,000 of business annually and will result in an enlargement of the working force. A number of men expert in the making of laundry drying machinery, product of the Syracuse concern, have already moved to this city and other families will probably be brought here as the work progresses. Already operations have started on the contract and four of the machines will be turned between now and January. The new contract adds considerable to the business and payroll of the Bagley & Sewall Company, it was stated, and about 225 persons are now finding steady employment. The company is also doing a steadily increasing business in paper machine repairs and rebuilding and its business prospects are gradually growing brighter. The laundry drying machines for the Syracuse concerns are large and require considerable labor.

M. Jacobs Goes With Chas. T. Main

Chas. T. Main, Inc., consulting engineers, 201 Devonshire street, Boston, Mass., have announced that Milton Jacobs has joined the organization. Mr. Jacobs, who was recently chief engineer of the Brown Company, is to be in charge of a department in pulp and paper mill engineering.

This well known firm, which has specialized in structural, steam, hydraulic and electrical engineering, is now prepared to carry out a comprehensive engineering service to pulp and paper mills, covering process studies, design, plans and specifications, estimates, valuations and reports.

Mr. Jacobs' experience in the pulp and paper field over a period of twenty-seven years, has covered all phases of paper mill engineering, including building construction, operation, and the selection of operating equipment for process requirements.

Ohio Section Discusses Dyeing

The Ohio Section of The Technical Association of the Pulp and Paper Industry held a dinner meeting at the Hotel Manchester, Middletown, Ohio, Thursday Nov. 16, 1939. K. P. Geohegan, Chairman, presided at the business meeting following the dinner. This was the first mid-week meeting held in the Miami valley for several years and the attendance of approximately sixty indicated a definite interest for such meetings.

The speaker of the evening was F. A. Soderberg of the General Dyestuff Corporation, New York, N. Y., who discussed "Variables in the Dyeing of Paper," using a series of charts on which were displayed dyeings with different type dyes made up under varying conditions. Varying water conditions due to difference in locality, periodic changes such as high water stages and proximity to effluents of waste from other manufacturing establishments were shown to have a definite effect on many dyes.

Results were shown in the use of the same dye on various types of pulps and pulps from different localities, e.g., southern and northern bleached kraft.

The action of fillers, size and alum, hydration, rotation of order of addition of color, size and alum and hydrogen-ion concentration were all shown to affect the result in the dyeing of paper. In connection with certain of these variables Mr. Soderberg pointed out that in individual mills very suitable results are obtained with procedures that are adopted more for sheet characteristics than for dyeing.

A discussion folowed the formal talk.

Among those present were:

L. C. Currier, F. E. Moser, R. B. Roe, R. H. G. Smith and R. P. Kast, Sorg Paper Co., Middletown, Ohio; Leo Fleischer, Charles Rybolt, John Burdsall and H. H. Harrison, Crystal Tissue Co., Middletown, Ohio; H. W. Laymon, K. F. Miles, H. A. Smith and R. S. Yates, Mead Corporation, Chillicothe, Ohio; H. H. Latimer, Arthur F. Gardner, T. M. Chemerys and K. H. Snyder, Champion Paper and Fibre Company, Hamilton, Ohio; Charles Pflanzer, Edward Lum, H. C. Leighton, Wm. Reigers, Val Friedrich Jr., M. L. Barker and Wm. Beckett, Beckett Paper Company, Hamilton, Ohio; O. P. Gephart, P. S. Cade, and A. J. Smith, Miamisburg Paper Company, Miamisburg, Ohio; Thage Dahlgren, C. R. Boggs, Jack Smith, Stewart Rogers, Ed Geran, W. H. Boast, C. R. Merriman and S. R. Holmes, Gardner Richardson Co., Middletown, Ohio; Myron Wittmer, Cheney Pulp and Paper, Franklin, Ohio; F. A. Soderberg and P. R. Schreiber, General Dyestuff Corporation; K. P. Geohegan, Aetna Paper Co., Dayton, Ohio; J. A. Nicklis, Wallace & Tiernan Company, R. M. Bond, Middletown, Ohio; L. G. Wood, Paper Converting Machine Company, Green Bay, Wis.; E. C. Jacobi, Sandy Hill Iron and Brass Works, Kalamazoo, Mich.; Jack Dickson, R. T. Vanderbilt Company; O. W. Hein, Tony Agronin and Pete Jerardi, Shartle Brothers Machine Company, Middletown, Ohio; M. H. Stetson, Harding Jones, Middletown, Ohio; W. M. Bain, Glidden Co.; W. D. Boggess, Beveridge Paper Company, Indianapolis, Ind.; Howard Buechler and William Macklem, Black Clawson Company, Hamilton, Ohio; Robert R. Weber, Mathieson Alkali Company; J. H. Tate, Howard Paper Company; Charles A. Ault, New York Color and Chemical Company; Arthur Kjellstrand, Ault and Wiborg Carbon and Ribbon Inc.; B. Benson, Williams Gray Company; Buster Griffiths, Williams Gray Company, and E. L. Puffer, Heller & Merz.

Stein, Hall Builds Factory Addition

Stein, Hall & Co., are constructing a five-story and basement addition to their factory in Long Island City, New York, which will provide about 27,000 square feet of new production space to meet increased demand for the company's gums and dextrines, which are used by the paper box, envelope, textile and other industries. The addition will be completed in January. Construction was started some time ago as increasing business, even prior to the outbreak of hostilities in Europe made the need for enlarged production facilities imperative. The top floor will provide an ideal set-up for enlargement of the Long Island City Laboratory.

Construction is of brick-enclosed steel and the floors will be concrete, so that the structure will be fireproof. The fifth floor will present a penthouse appearance because the walls will be set back from a parapet running around the edge of the fourth floor roof. This penthouse design will help to make the laboratory floor dust-proof because its windows will not be in line with those of the factory floors below but will have clear air space all around. The laboratory floor will also be subject to comparatively little vibration. This floor will include rooms for pilot plant operations, instruments, research and routine work. The laboratory will have plenty of daylight from 23 windows and seven skylights.

The addition will have a total of more than 70 windows, most of them unusually large. Even the basement, most of which is above ground will have ample light. At the north end of the street floor there will be a receiving platform with more than 600 square feet of floor space and two large roll-up doors. The platform at the opposite end of the present building will be used for loading outgoing shipments. Doors at the south end of each floor and the basement will connect the addition with the present building. The third and fourth and the laboratory floors will be provided with showers. A new boiler house is being constructed to supply additional steam for heating and production purposes.

Construction work is being done by the W. J. Barney Corporation and the plans were drawn by A. R. Burnette, both of New York City.

Newfoundland Production High

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 20, 1939—From Newfoundland it is reported that the paper mills at Cornerbrook and Grand Falls are both operating at capacity. According to the reports of the two paper companies, they will cut 555,000 cords of wood this season for their own use and for export, while a further 135,000 cords will be cut by others for local lumber requirements and for export as pulpwood and pit props.

A Blackboard of Pulpwood Cutting

All of us remember what an important part the blackboard played in our early education. As we sat at our desks listening to the teacher and watching what she drew or wrote on the blackboard we didn't realize that we were "getting it" much easier by being able to be "shown" at the same time we were "told."

The Southern Pulpwood Conservation Association cooperating with the Virginia Forest Service in trying to "get across" an important phase of forestry recently adapted this form of education—showing the people as they told them—to their use, only the blackboard they used instead of one hanging on a wall was a plot of ground with trees growing on it. The lesson they were teaching was "Proper Methods of Cutting Pulpwood," the class lasted all day on September 29, and the students comprised some 450 people, landowners, wood procurement men, contractors, classes from agricultural schools, etc., who visited the demonstration pulpwood cutting in Buckingham County, Va., sponsored by N. E. Spessard & Sons, Richmond, Va., under the supervision of the Woodland Department of the West Virginia Pulp and Paper Company and the Virginia Forest Service.

This demonstration cutting was a big success as was shown by the large attendance and the amount of interest displayed by those attending.

N. E. Spessard & Sons, who sponsored the demonstration, advertised it thoroughly in advance through newspaper announcements, circular letters to all pulpwood producers in the section, and handbills freely distributed which read thus:

GROW PULPWOOD
LIKE OTHER FARM CROPS
FREE DEMONSTRATION
of Proper Conservation Methods
to increase future growth,
under the supervision of
an Expert Forester.
FRIDAY, SEPTEMBER 29, 1939
from 9 A.M. to 6 P.M.
In Buckingham County on Route 15,
3 miles north of Dillwyn.
Everyone interested in the present
and future production of Pulpwood
is cordially invited to attend.

They secured the site of the demonstration, erected a large sign, and furnished the labor necessary to cut the trees and prepare the area for inspection. Supervision in preparing the demonstration was provided by the Woodland Department of the West Virginia Pulp and Paper Company and by the Virginia Forest Service under the direction of F. C. Pederson, State Forester.

The seed tree method of cutting was demonstrated. Ninety-four trees, all over 8 inches in diameter one foot above the ground were removed and six seed trees were selected to remain to reseed the one acre demonstration area. All trees under 8 inches in diameter were left growing. Six technical foresters were on hand all day to explain the demonstration and answer questions pertaining to why certain trees were cut and others left.

In commenting on this demonstration three phases deserve emphasis:

1. Its informality. There was no formal meeting, program, or area inspection at a certain hour. This allowed a free exchange of ideas between those in attendance and those explaining the type of cutting.

2. The great amount of interest (as testified by large attendance) in practical forestry measures on the part of those whose income or wages are dependent upon forest products.

3. The high type of cooperation in its sponsorship and execution including the Virginia Forest Service, N. E. Spessard and Sons, and the West Va. Pulp and Paper Company.

The Southern Pulpwood Conservation Association hopes to sponsor numbers of these demonstration pulpwood cuttings throughout its territory believing that this new blackboard is a big help in explaining the cutting rules adopted by the association.

Egypt May Manufacture Newsprint

Expanded domestic manufacture of newsprint and other paper is now under consideration in Egypt, according to a report from American Commercial Attache J. T. Scott, Cairo, made public by the Forest Products Division, Department of Commerce.

At the present time, the report shows, there is only one paper mill in the country, located in Alexandria, which produces a coarse variety of wrapping paper. A new organization, known as the National Paper Company, was recently established also to manufacture coarse wrapping paper and probably will later produce newsprint paper. This plant, however, has not yet begun operations.

Egypt's requirements of newsprint paper, amounting to more than 20 million pounds annually, are obtained entirely from Baltic countries. Because of the international situation now prevailing, the price of newsprint has been advancing steadily, a development which is causing concern in the local printing industry. Alexandria printing establishments have recently petitioned the Government to requisition all stocks of paper available in the country to prevent further price increases.

The Government is aware of the difficulties facing the country's paper-consuming industries and it is understood that financial as well as moral support will be extended to interests qualified to establish a local paper-manufacturing industry on a sound, substantial basis.

Carthage Brotherhood Nominates Officers

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., November 21, 1939—Members of the local branch of the International Brotherhood of Pulp and Sulphite Workers connected with the National Paper Products Company, met at the rooms of the Chamber of Commerce this week at which officers for the ensuing year were nominated. The election will be held early in December. The nominations were as follows: Herman G. Getman, Arche Mossott and William Dalton, president; John Burnell and Edwin Zecher, vice-president; Arthur Alcombrack, Armond Morrisete and Bert Elliott, financial secretary; Lela Morse and Donald Marcott, treasurer; Cecelia Lalonde, corresponding secretary; Flossie Gaines, Paul Prieve and Clarence Bancroft, trustees.

N. E. TAPPI Testing Instrument Symposium

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Roger Smith Hotel, Holyoke, Mass., on Friday evening, November 17, 1939. Randall H. Doughty of the Fitchburg Paper Company presided as Chairman. About one hundred attended.

The program was unusual and was directed by the Testing Instruments Subcommittee of the Technical Association. Eight instrument manufacturers were represented and had a brief interval in which to point out new features regarding their products. The following speakers participated: H. Z. Schniewind of Testing Machines, Inc., New York, N. Y. on "The Tensile and Folding Tester"; B. Hall of Thwing-Albert Instrument Company, Philadelphia, Pa., on "The Tear Tester"; Lewis Muscat of R. Fuess, Inc., New York, N. Y. on "The Smoothness Tester"; R. F. Taber of the Taber Instrument Company, Tonawanda, N. Y., on "The Abrasion and Wear Tester"; F. M. Williams of the Williams Apparatus Company, Watertown, N. Y., on "The Porosity Tester"; W. L. Egy of W. & L. E. Gurley Company, Troy, N. Y., on "The Stiffness and Bending Tester" and W. L. Foote of B. F. Perkins Company, Holyoke, Mass., on "The Bursting Tester." The presentation of each paper was followed by a discussion of the subject.

Following these presentations, the Solvay Process Company showed a moving picture entitled "The Chlorine Emergency Kit." In this interesting and instructive picture, it was clearly shown how accidents and emergencies can be handled when using chlorine in small containers and in tank cars.

Among those present were:

R. C. Charron, R. D. McCarron, D. B. Williams, J. P. Strasser, W. R. Willets, A. K. Warner, Harold R. Miller, R. F. Irwin, S. A. Brunell, Frank W. Nyborn, L. N. Smith, E. L. Connolly, Paul Knight, A. F. Gilmore, T. L. Fish, L. Perkins, John Schniewind, George Geene, E. G. Ham, A. O. Bragg, H. T. Barker, H. M. Grasselt, E. LeBlanc, W. L. Egy, Justin P. Waite, R. G. Macdonald, Ollie W. Messner, Arthur B. Green, R. H. Doughty, R. E. Kilty, R. F. Taber, Andrew S. Hall, John B. Calkin, Roger C. Griffin, A. W. Neubauer, J. C. Barthel, A. Blockman, Robert D. Metcalfe, Lester M. Start, Jr., James F. Leahy, P. B. Holden, G. E. Mangsen, B. F. Collison, Helen U. Kiely, Lena E. Kelley, A. M. Altieri, A. C. Lamoureux, G. A. Peterson, H. L. Mellen, William Anderson, Donald Young, Joseph H. Burgen, John P. Kennedy, Albert Dyson, Vincent Tranfalgia, Andrew Jackson, John T. Leecock, A. L. Perry, J. J. Thomas, Norman Bearse, Harold Brakewood, Henry Mellen, Edwin Bieniek, Thomas Flaherty, C. L. Reece, Charles Backus, R. W. Pattison, F. W. Schneider, Lewis Muscat, and Percival Gooding.

Fine Paper Div. Meet in Boston

BOSTON, Mass., November 20, 1939.—A luncheon meeting of the Fine Paper Division of the New England Paper Merchants Association was held Thursday, November 16, at the Boston Chamber of Commerce, when matters of interest to the trade were discussed. Frederick G. Lockwood, vice-president in charge of the Fine Paper Division, presided.

Michigan Superintendents Meet

KALAMAZOO, Mich., November 20, 1939—The Michigan Division of the American Pulp and Paper Mill Superintendents' Association held its November meeting at the Park-American Hotel on November 16 with sixty present. Mr. E. Peterson, manager of the paper mill division of the B. F. Goodrich Company, was the guest speaker. He explained in detail his company's newly developed process of covering rolls—a welded steel jacket being installed next to the roll, in place of a hard rubber base, and the outside coating built up from that. His talk was accompanied by a series of slides showing the full operation and held the attention of the group.

A most interesting forum followed the address, Mr. Peterson being a recognized authority on rolls, much instructive information was brought out. A rising vote of thanks was tendered him before the meeting adjourned. Those attending were:

Fred Hodgemire, J. F. Tooker and N. J. Cowie, Hawthorne Paper Company.

E. Peterson, K. E. Freund and Glen V. Cathey, B. F. Goodrich Company.

R. D. Miller, H. W. Hartman, Willard Barnhart II, Jos. Hartman, Arthur Hanson and T. P. Nichols, American Box Board Company.

Fred Scheid and L. J. Scheid, Watervliet Paper Company.

A. Weller, Glen Sutton, John A. Heenan, D. D. Bachelder, W. B. Hadley and A. L. Sherwood, Sutherland Paper Company.

H. C. Bradford, Henry Nendorf, Joe Waber and A. W. Cole, Rex Paper Company.

Joseph Loughead, W. F. Costello, Loughead Company.

L. H. LaLiberte, Al Perlick, R. B. Stewart, W. F. Hathaway and G. H. Rice, Kalamazoo Vegetable Parchment Company.

W. F. Wolf, P. Short, Clem Sisson, T. Sisson, J. Coyle and R. B. World, Mac Sim Bar Paper Company.

R. L. Barton, G. C. Schmid, M. S. Fogerty and Paul de Guehery, Michigan Paper Company.

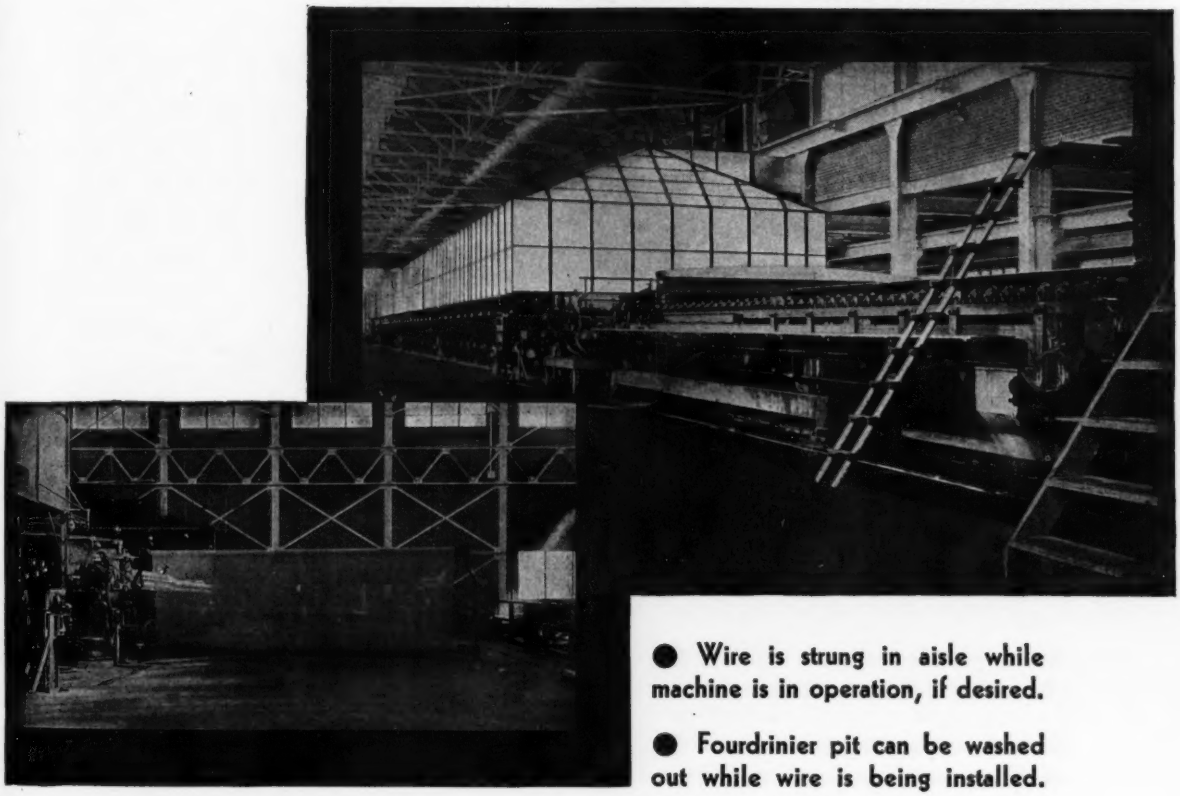
H. F. Kleinman, Fred Chappell and P. F. Neumann, Hercules Powder Company.

F. L. Zellers, Past National President; Jake Parent, Noble Wood Company; Lloyd A. Knapp, Consolidated Paper Company; H. E. Stafford, retired; O. W. Callighan, Edgar Bros. Company; C. "Baldy" Smith, Huron Milling Company; W. M. Nash, Gilbert Nash Company; R. W. Holden, Stowe Woodward Company; J. J. Ely, Peninsular Paper Company; R. H. Smith, Bryant Paper Company; A. E. Fuller, McClusky & Sons Inc.; Jake Boodt, Kalamazoo Paper Company; Jos. E. Dennany, Allied Paper Company, and H. E. Stratton, PAPER TRADE JOURNAL.

Reduction in Venezuela Agreement

WASHINGTON, D. C., November 22, 1939—In the new trade agreement negotiated last week between the United States and Venezuela on plain writing paper a duty reduction was obtained by the United States of 25 per cent from the existing rate of 1.20 bolivares per gross kilo. Our exports of this type of paper to Venezuela last year were valued at $171,000.

THE BELOIT *Removable Fourdrinier*



● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

● All wire poles are mounted in carriage before loop is formed. Inside poles are inserted inside the wire.

● Safest — most convenient — quickest method of installing Fourdrinier wire.

THE BELOIT WAY BELOIT IRON WORKS PAPER MACHY BELOIT, WIS. U.S.A. IS THE MODERN WAY

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Cloquet, Minn.—The Northwest Paper Company, has plans nearing completion for new addition to mill for increased capacity. It will be one and multi-story type, reported to cost close to $100,000, with equipment. Work is scheduled to begin early in December, with completion next March.

Chicago, Ill.—The Eagle Paper Box Manufacturing Company 2309 South Keeler avenue, manufacturer of stiff paper boxes and containers, etc., has approved plans for new plant on tract of land at Monitor and Bloomingdale avenues, totaling about 60,000 square feet, recently secured under a 15-year lease. New plant will be one-story, 150 x 340 feet, estimated to cost close to $100,000, with equipment. General construction award had been made to the Campbell-Lowrie-Lautermilch Company, 400 West Madison street, and work will be placed under way at once. Completion is scheduled early in March, when present plant will be removed to new location and large increased capacity carried out.

Appleton, Wis.—The Appleton Coated Paper Company, North Meade street, has completed plans for extensions and improvements in power house at mill, including erection of a new one-story addition to be used for expansion in engine room. Contract for erection has been let to the Koepke Construction Company, Appleton, and work will proceed at once. Additional equipment will be installed.

Phillipsdale, R. I.—Bird & Son, Inc., East Walpole, Mass., manufacturer of wall board, press board, roofing papers, etc., has asked bids on general contract for new factory branch, storage and distributing building at Phillipsdale, to be one-story, 70 x 140 feet, reported to cost close to $45,000, with equipment. Erection award will be made at early date and work placed under way. As recently noted in these columns, company has awarded a contract to MacDonald & Belbin, Inc., 83 Broad street, Boston, Mass., for new addition to East Walpole mill, on site on Washington street extension, designed primarily for storage and distribution. Work is being placed under way, with completion scheduled at early date. Cost estimated approximately $50,000, with equipment.

Louisville, Ky.—The General Box Company, 816 South 16th street, manufacturer of corrugated boxes and containers, has approved plans for new one-story addition, reported to cost close to $30,000, with equipment. A building permit has been secured and work will begin at once.

Chester, Pa.—The Scott Paper Company, manufacturer of tissue stocks, has plans for new one-story building to be equipped as a filtration unit. Bids have been asked for erection and contract will be awarded soon. No estimate of cost has been announced.

New York, N. Y.—The Saxon Paper Products, Inc., 15-17 Mercer street, paper specialties, has arranged for lease of space in building at 236-42 West Eighteenth street, comprising three floors and basement, totaling about 75,000 square feet of floor space, and will occupy for new plant and headquarters. Alterations and improvements will be made, and possession taken early in January. Present plant will be removed to new location and considerable increased capacity arranged.

Cumberland, Md.—The Celanese Corporation of America, Inc., 180 Madison avenue, New York, N. Y., manufacturer of cellulose rayon products, has work nearing completion on new one-story addition to mill at Amcelle, near Cumberland, to provide for considerable increase in present capacity. Structure will be ready for machinery installation at early date, and is reported to cost over $175,000, with equipment. Company also has work under way for expansion in water supply at the same mill. A new dam will be constructed on the Savage River, to be over 1200 feet long, providing a uniform flow from the Potomac River. Pipe lines and other facilities will be installed. Entire project is estimated to cost in excess of $2,500,000.

Neenah, Wis.—The Neenah Paper Company will make improvements in power house at mill, including installation of additional equipment. A contract for a centrifugal boiler feed pump, with capacity of 350 gallons per minute, has been awarded to the Cameron Pump Division of Ingersoll-Rand Company, New York, N. Y., and orders for other required equipment will be placed soon. Charles A. Cahill & Sons, 724 East Mason street, Milwaukee, Wis., are consulting engineers.

Houston, Tex.—The Pollock Paper and Box Company, 2236 South Lamar street, Dallas, Tex., manufacturer of paper specialties, paper boxes and containers, etc., will carry out work by day labor and several sub-contracts for establishment of new branch plant at Houston, where a one-story industrial building at 4204 Jefferson street has been secured under lease, as recently noted in these columns. Work on remodeling and improving structure is being placed under way and it is expected to have the structure ready for machinery

installation in the near future. Plant will be equipped for the production of waxed, paraffin and kindred processed paper stocks, and is reported to cost close to $150,000, with equipment. L. L. Jacobs is vice-president.

Kaukauna, Wis.—The Outagamie Mills, Inc., recently chartered under State laws to operate a local paper mill, is said to be concluding negotiations for the acquisition of the former mill of the Patten Paper Company, Ltd., idle for some time past and now owned by the city. A similar line of paper products will be manufactured at the plant, it is stated, including envelope, catalog, cover and allied stocks. It is proposed to make improvements at the mill and to have the plant ready for service early next year. Incorporators of the new company include Milford J. Taylor, A. J. Johnson and Daniel E. McCarty, Kaukauna.

Chicago, Ill.—The Printers Paperteria, 907 North Larabee street, paper products, has arranged for lease of the entire first floor of building at location noted, extending to 911 North Larabee street, and will occupy for company headquarters, storage and distribution.

Netherlands Controls Raw Materials

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 22, 1939—In the so-called Netherlands Distribution Law 1939, the Minister of Economic Affairs is empowered to take control of businesses in certain goods in order to effect an efficient distribution of merchandise in the interest of the national household and the National Defense.

In line with this policy the government has taken control of business in raw materials for the paper industry. In the sense of this law, paper raw materials imply: chemical pulp, pulpwood, ground wood, resin soap, resin, old paper, paper waste, and rags, so far as they do not consist wholly or largely of wool, or wholly or largely of cotton.

All paper manufacturers have been ordered to register with the newly established government Bureau for Paper. This Bureau will charge its expenses proportionately to the paper manufacturers, so far as these expenses are not covered by receipts from licenses. This government Bureau may also demand a registration fee of 100 guilders from each paper manufacturer, which will be refunded upon liquidation of the Bureau.

Lewis Brown Gets Franklin Medal

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 20, 1939—National leaders of industry, finance and education gathered last Wednesday evening at the Franklin Institute on the Parkway for the first presentation of the Institute's newest medal.

Lewis Herold Brown, 45-year-old president of the Johns-Manville Corporation, one of the youngest there, was the recipient. The award was the Vermilye Medal to be presented biennially "in recognition of outstanding contributions in the field of industrial management." It marks the Institute's first recognition of the guidance of big corporations as an applied science. The donor was William Moorhead Vermilye, vice-president of the National City Bank of New York.

Cooperate on Water Pollution

(Continued from page 11)

may be called a service charge to the insurer. At the end of the year he will be credited or penalized, according to his loss experience during the year. Under the old plan, all concerns were grouped for rate-making purposes, making self-insurance more attractive to employers who provided extraordinary safety and health services. Numerous leading manufacturers have endorsed the new plan.

New Power Line to Falls Pulp & Paper Mills

The Wisconsin Michigan Power Company has been authorized by the Wisconsin Public Service Commission to build an electric transmission line from Gillett to Oconto Falls, Wis., where the Falls Pulp and Paper Company is located. A substation is to be built at the utility's dam at Union Falls. Total cost of the work is estimated at $13,000.

Navigation on Fox River Closes

Barging of coal from the docks at Green Bay, Wis. to mills of the Fox River Valley is to be stopped for the season November 22. Navigation has been ordered closed on that date on the Fox River and Lake Winnebago.

Favorable weather has permitted a longer boating period than in other years. Most of the shipping is done by the Fox River Navigation Company, operated cooperatively by the mills.

Dr. and Mrs. Westbrook Steele Hold Reception

Dr. and Mrs. Westbrook Steele held an informal reception at their home at Appleton, Wis., Sunday afternoon, November 12, for the members of the faculty and staff of the Institute of Paper Chemistry and their wives.

This is an annual event and was attended by more than 100 persons. Dr. Steele is executive director of the Institute.

Dr. Davis Resigns from Paper Institute

Dr. Herbert L. Davis has resigned as a research associate of the Institute of Paper Chemistry, Appleton, Wis., and has taken a similar position with Johnson & Johnson Company, New Brunswick, N. J., makers of hospital supplies. He had served at the Institute for the last five years. Dr. and Mrs. Davis and their two children have already left for their new home.

Work Started on New General Chemical Plants

Construction of two plants, one at Menasha and another at Wisconsin Rapids, Wis., has been started by the General Chemical Company of New York City, to manufacture liquid aluminum sulphite for bleaching and water purification. The plants will provide a nearby source for paper mills of both the Fox and Wisconsin River Valleys. Completion is expected within about six weeks, after which the plants will be placed in operation.

The buildings will be of metal construction, approximately 50 by 100 feet in size. The cost of each is estimated at $12,000.

Both contracts have been awarded to the Charles Gambsky Construction Company, Menasha, Wis. Steel contracts have been awarded to the Blaw-Knox Company, Pittsburgh, Pa.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Vol. 109 New York, November 23, 1939 No. 21

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel. Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club. Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel. Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park American Hotel, Kalamazoo, Mich.

BUSINESS CONTINUES UPWARD

Industrial production has now reached a level slightly above that for December, 1936, or 121 per cent of the 1923-1925 average, as indicated by the Federal Reserve Board index. Although the increase in activity was, of course, much less rapid in the first half of this month than in the two previous months, it is expected by some economists and business leaders that a new all-time high record is likely to be attained this year. The paper industry, like many major industries, has been operating practically at capacity for some months, and has in subsequent years twice topped the 1929 production figure. In 1929, for example, the aggregate domestic production of all kinds of paper was 11,140,200 tons or 80 per cent of theoretical capacity; in 1936, 11,975,552 tons or 83 per cent of capacity, and in 1937, 12,838,003 tons or 85 per cent of capacity.

In the report of the Federal Reserve Board on November 17 it was observed that while production continued to rise, commodity prices generally showed little change in October and the first half of November. "Price changes that had occurred since the general sharp rise in September," the report said, "have reflected largely particularly upon individual commodities, while prices of most other commodities, including finished industrial products, showed little change."

The high rate of industrial activity has, during September and October, increased employment by 700,000, according to the latest report of the Department of Labor, which stated that payrolls were up 4.3 per cent in September and the previous month and 3.8 per cent in October over September. Of the 90 industries surveyed by the Bureau of Labor Statistics, 72 reported increased working forces and 66 showed a rise in payrolls, factory employment reaching the highest level since November 1937. The September factory employment index of 100.1 per cent, with 1923-1925 equalling 100, was 8.8 per cent higher than for the like month in 1938. The payroll index at 93.7 per cent, was 14.8 per cent higher than a year ago.

Business activity on October as measured by check payments were, according to the Federal Reserve Board report, 5.46 per cent larger than in October last year. Increased business activity was reported in 35 states while 13 states reported declines. Business was better than the national average in most of the southern states and in a few eastern states. Despite what appears to be a minority opinion that a decline of some severity in business activity may be expected sometime next month, this belief does not seem very general. According to Jesse H. Jones, Federal Loan Administrator who, commenting on the widespread nature of the business upturn said on November 7, that "he wouldn't worry too much about published reports that a slump might occur early in the year.

According to Mr. Jones, the decline in applications for small loans tells the real story of business expansion and prospects. While making no predictions for the future of business, he said, "I think business is going to be fair. I hope we won't have anything like a boom and I don't see any indication of one at this time." Figures which the RFC released showed that it had authorized 6,943 loans since it resumed lending in February, 1938, amounting to $1,416,122,249. Of the aggregate number, 5,929 extensions of credit amounting to $302,137,136 were made to business, including more than $23,000,000 later taken up by banks. Banks participated in the business loans to the extent of $70,127,000, making a grand total of business credit stimulated by the government of more than $349,000,000.

In commenting on capital requirements the *Washington Review* published by the Chamber of Commerce of the United States points out that, "Despite artificial handicaps and hindrances, business shows unmistakable signs of an accelerated pace. Volume is increasing, and the hope arises that there now may be in sight business earnings commensurate with the amounts of capital invested, the risks that are taken and the tought and effort applied. There remains, however, the task of putting still more idle men and dollars to work . . . Business men, with past experiences fresh in mind, are alert to the dangers that follow boom volume and boom prices. They are proceeding cautiously and sensibly to avoid a recurrence of conditions that followed in the wake of 1914. To paraphrase the composite view of those expresing opinions on the present state of hostilities: 'America can't wait on overseas developments for its prosperity, or for a settlement of the age old problems

of Europe. We must keep out of foreign troubles and proceed in our own American way with the development of our own domestic economy'."

The Chamber's survey discloses no lack of the business courage that has carried industry forward in the past. It does reveal, however, that business men feel that they have had to deal with an attitude reflected in legislation, and in its administration, which certainly has not inspired advancement. Chief among the hindrances that discourage larger investments are cited, "confiscatory taxes, uncertain labor conditions due to operation of the unfair Wagner Act and the Wage Hour Law, government competition, experimental legislation in many economic fields and a general feeling of puzzlement and uncertainity brought about by public expressions in quarters of official responsibility. Many perceive in Congress an attitude of increased understanding of the requirements of business and a growing recognition among lawmakers of the fact that legislative legerdemain has not fulfilled expectations."

Southern Pulpwood Men Meet

The director and officers of the Southern Pulpwood Conservation Association met November 7 at the Ansley Hotel in Atlanta, Ga. This was a special meeting called by the president, J. H. Allen, to discuss matters of importance concerning the future activities and further usefulness of the Association.

At the close of a business session, which was attended by eighteen representatives of the pulpwood industry, a delightful luncheon was tendered those present, together with several invited public forestry officials, by the Southern Pulpwood Conservation Association. A private dining room of the Ansley Hotel was decorated in the eight common species of pine which are used in the South for pulping purposes, together with enlarged photographs showing good and poor cutting practices, effects of fire protection, etc.

A most interesting feature of the entertainment was a moving picture "Pine Ways to Profit." This film, prepared by the U. S. Forest Service is a very fine fire protection picture and was enjoyed by all present.

The regular annual meeting of the Southern Pulpwood Conservation Association will take place in Atlanta some time in January 1940.

Three Macklem Generations in TAPPI

The recent election of Harold G. Macklem as a junior member of the Technical Association of the Pulp and Paper Industry, provided the first occasion wherein three generations of one family held membership in the Association at one time. Harold G. Macklem is now assistant to the master mechanic of the United Paperboard Company, Thompson, N. Y., and a recent graduate. His father W. W. (Bill) Macklem is sales engineer for the Black-Clawson Company, Hamilton, Ohio, and his grandfather is G. A. Macklem, Vice-President in charge of sales for the Beloit Iron Works, Beloit, Wis.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1939	1938	1937	1936	1935	1934
January	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	96.7%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	72.3%	80.6%	81.3%	70.5%	.....
First 45 weeks	83.5%	71.7%	84.6%	80.5%	70.2%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1939		CORRESPONDING WEEKS, 1938	
October 7	93.0%	October 8	81.6%
October 14	96.9%	October 15	83.0%
October 21	98.5%	October 22	83.8%
October 28	98.3%	October 29	81.8%
November 4	98.5%	November 5	82.4%
November 11	98.4%	November 12	80.9%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Oct. 7, 1939	Oct. 14, 1939	Oct. 21, 1939	Oct. 28, 1939	Nov. 4, 1939	Nov. 11, 1939
0% to 50%	32	34	33	35	31	23
51% to 100%	273	269	271	264	259	169
Total Mills Reporting	305	303	304	299	290	192

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1935	62%	68%	68%	63%	61%	66%	62%
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1935	67%	71%	77%	71%	61%	66%
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	....	....	....

Week end. Oct. 7, 1939—84%
Week end. Oct. 14, 1939—83%
Week end. Oct. 21, 1939—84%
Week end. Oct. 28, 1939—85%
Week end. Nov. 4, 1939—84%
Week end. Nov. 11, 1939—84%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

Japan Produces More Pulp

WASHINGTON, D. C., November 15 — Production of wood pulp by members of the Japan Paper Manufacturers Association aggregated 211,068 short tons during the second quarter of 1939, an increase of 11 per cent over the output of the preceding 3 months and of 8 per cent over production during the corresponding quarter in 1938. Total production of wood pulp by members of the Association for the first 6 months of 1939 reached a total of 401,332 tons, an increase of 20,806 tons.

Increased activity was noted in the Japanese paper and pulp industries during the second quarter, but the production of staple fiber continued to be restricted as a result of the scarcity of suitable raw materials for its manufacture. Despite restrictions on the use of newsprint, paper output during the second quarter totaled 259,515 tons, an increase of 9 per cent in volume over the first quarter production.

IN the Stamford Research Laboratories of American Cyanamid Company a skilled technical staff, equipped with up-to-the-minute facilities, is constantly giving valuable assistance to the paper industry and fostering progress through the development of chemicals for the improvement of paper production.

SIZES
ALUM
AEROSOL* WETTING AGENTS
COATING MATERIALS
SULPHONATED OILS
DEFOAMERS
TAPIOCA FLOUR
FILLERS
and OTHER PAPER CHEMICALS

AMERICAN CYANAMID & CHEMICAL CORPORATION

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

*Trade-mark of American Cyanamid & Chemical Corporation applied to wetting agents of its own manufacture.

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of Paper Industry Literature

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Raw Materials

Process for the recovery of pure paper stock from printed old paper. Murzynowski, Berlin. Ger. pat. 657,368 (July 16, 1936). The cleaning agent consists of a mixture of soap solution and dilute acetic acid, the soap solution predominating. In this manner the fibers are not injured.—J.F.O.

Process for the recovery of pure paper stock from paper and board waste provided with aluminium covering. Halberstadt, Halle. Ger. pat. 654,223 (Sept. 28, 1935). The waste is treated with solvents in the presence of aluminium activating means.—J.F.O.

De-Inking and Defibering Waste Paper. Edward H. Partington, Denis R. S. Becker and Wm. H. Porritt. Brit. pat. 495,636 (Nov. 10, 1938). Clean pulp is produced by steeping (e.g., in sodium hydroxide solution at 160° to 200°F.) printed or pigmented waste paper, paperboard, etc., and agitating to set up opposed conflicting liquid streams of sufficient intensity to cause the fragments in one stream to engage frictionally with those of the other and thus separate the fragments into discrete fibers freed from ink and filler which are subsequently washed out. If the waste paper contains little or no loading, china clay, etc., it may be added to assist in washing out the ink.—A.P.-C.

Process for Defibering Grasses and Straws. Georges Moulaert. Fr. pat. 834,093. The material (which may be in the form of pressed bales) is placed in a closed vessel under reduced pressure and saturated with preheated water. It is then steamed with saturated steam at 150° to 160°C., and the condensate is collected with a view to recovering by-products.—A.P.-C.

Treating Waste Paper Stock. Arno W. Nickerson and Emil C. Gildensopf. U. S. pat. 2,142,823 (Jan. 3, 1939).—Mixed waste paper stock is treated in a breaker beater. The beaten stock mass is subjected to a refining step wherein there is effected a mechanical although non-cutting disintegration by way of attrition and shredding, through suitable enformed contacts of the stock with suitable shred-producing surfaces of attrition accompanied by rehydration, the disintegration forming the stock into a substantially defiberized portion including defiberized and rehydrated fibers and a substantially nondefiberizable portion such as trash. The refined stock is screened selectively to classify it into rejects which fail to pass through the screen and into accepted refined stock. The accepted stock is subjected to a second screening to classify it into lumps of hard paper stock which has escaped defiberization and into an accepted stock substantially free from both trash and lumps. The lumps of hard stock are recirculated back to a point in the system ahead of the refining steps, while the accepted stock is fed to a paper machine.—A.P.-C.

Process for the Removal of Printing Ink From Printed Papers. B. Rassow and E. Herfurth. Belg. pat. 429,333 (Aug. 31, 1938). — Pyrophosphates, preferably alkali pyrophosphates, are used as deinking reagents.—A.P.-C.

Lignin

Catalytic Hydrogenation of Lignin. Earl C. Sherrard and Elwin E. Harris, assignors to the Secretary of Agriculture of the U. S. A. U. S. pat. 2,146,655 (Feb. 7, 1939).—Lignin is converted into *p*-propylcyclohexanol, 4-propyl-1, 2-dihydroxcyclohexane, 3-*p*-hydrocyclohexyl-1-propanol and a high-boiling product having the empirical formula $C_{18}H_{33}O_3$, by treating the lignin with hydrogen and a suitable copper-chromium oxide catalyst at high temperatures and pressures for such time as to assure completion of the hydrogenation reaction. The mixture is removed from the container, the catalyst is recovered as by centrifuging, and the above-mentioned reaction products are separated. Lignin is converted into methanol and a fast-flowing thermosetting plastic material by suspending the lignin in a liquid medium inert to the action of hydrogen while subjecting the lignin to the action of hydrogen in the presence of nickel at substantially 250°C. and under a pressure greater than 2000 lb. per sq. in. for such a time as to ensure completion of the hydrogenation reaction. The reaction mixture is removed from the container, the catalyst is recovered (e.g., by centrifuging), and the methanol and medium are separated by fractional distillation.—A.P.-C.

Sulphite Process

Process and Apparatus for Producing Bisulphite Solutions. Gustaf Haglund. U. S. pats. 2,147,161 and 1,147,162 (Feb. 14, 1939). **No. 2,147,161** —The apparatus comprises a tower includes an upper absorption and reaction section and a lower absorption and reaction section for receiving the material to be treated. The sections are so arranged that the material on its downward course from the upper to the lower section is deflected laterally. A liquor-collecting chamber is provided at the bottom of the tower, from which the liquor is pumped and sprayed into the top of the lower section at a point above the level of the deflected material. Water is sprayed at the top of the

upper section, and sulphur dioxide containing gas is passed through the tower in counter-current to the liquid. **No. 2,147,162** — This covers the process of making sulphite acid by means of the apparatus specified in the preceding patent.—A.P.-C.

Method of Operating Sulphite Digesters and Apparatus Therefor. Edward M. Frankel and Edward H. Barry, assignors to West Virginia Pulp and Paper Company. U. S. pat. 2,141,384 (Dec. 27, 1938).—A high degree of uniformity of heating of the charge is obtained by feeding thereto steam under constant flow while relieving the digester under substantially constant pressure. Constant flow of steam is best obtained by supplying the steam from a source under constant pressure and inserting a plate with a fixed orifice in the steam supply pipe. This permits of regulating the flow of steam with an accuracy of less than 1%, as compared with 2.5 to 5% with steam flow meters.—A.P.-C.

Recovery of Sulphur Dioxide In Sulphite Pulping. Walter H. Swanson and Donald C. Porter, assignors to Paper Patents Company. Can. pat. 378,288 (Dec. 13, 1938).—Tail gas from sulphited digestion is passed countercurrently in contact with raw sulphite liquor to dissolve a portion of the sulphur dioxide contained in the gas, then in contact with fresh water to dissolve the remainder of the sulphur dioxide and form an acidulated solution. The acidulated solution is collected to produce a solution of substantially constant acid strength, and introduced into the raw-acid-making tower at a point between the liquor inlet and the outlet.—A.P.-C.

Process for the Manufacture of Vanillin. Smith Chemicals, Ltd., Montreal. Nor. pat. 58,976 (Sept. 17, 1936).—If necessary, the thickened sulphite waste liquor or a similar solution of lignosulphonic acid product is first treated with hot caustic alkali at temperatures of 125° to 160°C. Carbonic acid is then used in the alkaline liquid to set free the vanillin which is extracted by means of solvents such as benzol and ethylene chloride which are immiscible with water. The solvent can be recovered and reused as well as the alkali which has been freed from the vanillin, by thickening, combustion and causticizing.—J.F.O.

Recovery of Sulphurous Acid Produced In the Sulphite Cooking Process. Zellstof-ffabrik Waldhof. Brit. pat. 489,753 (Feb. 9, 1938).—The spent liquor flows to a relief vessel and the gases given off here pass through a separator to a cooler where some of the sulphur dioxide dissolved in the steam is condensed. The aqueous and the gaseous sulphur dioxide then pass by different lines to an absorption vessel where the remainder of the gas is dissolved. This vessel consists of a counterpoised, inverted bell-jar, in the interior of which are nozzles spraying liquor from the cooler.—A.P.-C.

Reclamation of Sulphite Waste Liquor. Peter A. Paulson. Can. pat. 377,259 (Oct. 18, 1938).—Sulphite waste liquor is evaporated in several successive evaporators under successively increasing pressure. The cooking liquor of a pulp digester is heated by indirect heat exchange with the steam generated in the evaporator operating under lowest pressure, and the evaporators in turn are heated by the steam generated in the evaporator under next higher pressure. Steam for heating the evaporator under highest pressure is produced by burning the concentrated liquor in spray form under a boiler. An apparatus is described.—A.P.-C.

Process and Apparatus for the Recovery of Sulphur Dioxide From Sulphite Liquors. Karl L. Springer, assignor to Standard Oil Development Co. U. S. pat. 2,137,311 (Nov. 22, 1938).—The sulphur dioxide is recovered by the judicious addition of concentrated sulphuric acid to the liquor and drying the evolved sulphur dioxide by means of concentrated sulphuric acid. The sulphuric acid to be employed for decomposition of the liquor is fed to the reaction chamber containing the liquor through a packed tower countercurrent to the sulphur dioxide evolved from the reaction chamber, preferably after the bulk of the water has been removed from the sulphur dioxide by condensation.—A.P.-C.

Use of Sulphite Waste Liquor for Hardening and Waterproofing Concrete or Mortar. Edward W. Scripture, Jr., assignor to The Master Builders Company. U. S. pat. 2,127,451 (Aug. 16, 1938).—There are used together hydraulic cement, aggregate, a finely divided nonhydraulic filling material, and finely divided sulphite waste liquor residue in such proportions that the sulphite waste liquor residue is present in the mix in the proportion of 0.05 to 0.3% of the cement.—A.P.-C.

Process for Preventing Incrustation on Heating surfaces During the Concentration of Sulphite Waste Liquor. Wilhelm Gensecke, assignor to American Lurgi Corp. U. S. pat. 2,140,992 (Dec. 20, 1938).—There is formed a pool of sulphite waste liquor containing an amount of incrustation-forming components (including calcium products) in excess of that soluble in the volume to which the liquor is to be evaporated. Steam is introduced to heat the liquor to about 160° or 170°C. and heating is continued until about 16 to 25% of the incrustation-forming compounds is precipitated. The heated liquor is separated from the precipitated incrustation-forming compounds, is transferred to evaporators and evaporated to a volume equal to about one-quarter of the liquor when saturated with incrustation-forming compounds, substantially without decomposition and without further precipitation of the scale-forming compounds on the heat-exchange surfaces of the evaporators, thereby obtaining the concentrated sulphite waste liquor substantially without reduction of the thermal efficiency of the evaporators.—A.P.-C.

Tanning Material and Process for its Preparation. G. Bosio, F. Bosio and G. Baggini. Belg. pat. 425,136 (Jan. 31, 1938).—Synthetic tannin is added to sulphite waste liquor.—A.P.-C.

Manufacture of Tanning Materials. A. Carpmael, assignee of I. G. Farben-industrie A. G. Brit. pat. 438,560 (Oct. 16, 1936).—Sulphite waste liquor (of specific gravity 1.21 to 1.32), or a solution of ligninsulphonic acid obtainable therefrom, is incorporated with a water-insoluble non-tanning product obtained by condensing an unsulphonated monohydric aromatic hydroxy compound and a carbohydrate (containing not less than 5 carbon atoms) in an acid medium. The carbohydrate is

derived from cotton, wheat, soya-bean cake, glucose, beechwood or pinewood. The product may be after-treated with formaldehyde.—A.P.-C.

Tanning Liquor, Etc., From Sulphite Waste Liquor. Frederick J. Wallace, assignor to Robeson Process Company. U. S. pat. 2,142,739 (Jan. 3, 1939).—The waste liquor is neutralized and inoculated with a citric-acid producing mold that has been acclimatized to sulphite waste liquor. The fermentation is allowed to proceed in the presence of sufficient lime to form calcium citrate and at a temperature of about 35°C. The fermented mass is filtered to produce an improved waste liquor richer in tanning material and a filter cake of lime salts including citrate.—A.P.-C.

Preparation of Tanning Agents from Sulphite Waste Liquor. Rudolf Bauer, assignor to I. G. Farbenindustrie A.-G. U. S. pat. 2,148,893 (Feb. 28, 1939).—Ligninsulphonic acid and (or) its soluble acids are treated with a simple aromatic hydroxy compound and an aldehyde capable of linking aromatic nuclei (the acid value of the mixture being at least about 10), and the treatment is stopped when the aromatic hydroxy compound has been practically consumed and before insoluble compounds begin to form.—A.P.-C.

Tanning Materials from Lignosulphonic Acid. Hermann Noerr and Gustav Mauthe, assignors to I. G. Farbenindustrie A.-G. U. S. pat. 2,144,297 (Jan. 17, 1939).—Lignosulphonic acid is treated with a condensation product of an aromatic hydroxy compound containing only one hydroxyl group per benzene nucleus and a condensing agent known to be capable of linking aromatic nuclei, the condensing agent being free from sulphonic acid groups and being dispersible in the lignosulphonic acid solution.—A.P.-C.

Alkaline Process

Pulping Wood. George A. Richter, assignor to Brown Company Can. pat. 377,141 (Oct. 18, 1938). —Chipped wood is cooked in liquor containing sodium hydroxide and sodium sulphide, calculated as sodium oxide equivalent, in amount of 2 to 3 lb. per cu. ft. of liquor, and during the cooking circulatory communication is maintained between the liquor in the digester and a sufficiently large volume of similar liquor outside the digester to cause a volume of liquor corresponding to 0.3 to 0.6 lb. of sodium oxide equivalent per lb. of dry wood to participate in the cooking operation. An apparatus is described.—A.P.-C.

Process for Obtaining a White Pulp from Pinus Sylvestris. Paul Beyer and Otto Primavesi. Fr. pat. 835,620.—During the cooking the resins are converted into alkaline-earth salts by addition to the liquor of an alkaline-earth compound, suitable calcium chloride; and these soaps are rendered harmless by addition of an alkali triphosphate which produces a complex of the soap with alkaline-earth phosphate. If the pulp is bleached, it is advisable to add an excess of calcium chloride to the bleach liquor.—A.P.-C.

Pulping Process. Henry Dreyfus. Brit. pat. 496,887 (Dec. 7, 1938).—Cellulose is obtained from wood or other lignocellulosic materials by dissolving a substantial proportion of the lignin, by heating the materials under pressure with a relatively dilute solution of alkali, increasing the concentration of the alkali by evaporating water therefrom and further heating the materials under pressure with the more concentrated alkali so produced. The cellulose obtained may be purified further by succesive treatments with hot dilute alkali and cold more concentrated alkali.—A.P.-C.

Process and Apparatus for the Production of Vegetable Cellulose Having a High Alpha-Cellulose Content. G. Leon. Belg. pat. 427,452 (May 31, 1938.—Comminuted vegetable material is cooked by direct steam with an alkaline liquor containing sulphides.—A.P.-C.

Process for the Production of Cellulose. Martin Günther. Brit. pat. 491,842 (Sept. 7, 1938).—Straw or other grasses are saturated with a sodium hydroxide liquor in a rotary boiler, air is expelled by steam and the charge is then treated with dry superheated steam without increasing the moisture content of the charge. Sulphite or hydrosulphite is added with the sodium hydroxide as reducing agent.—A.P.-C.

Extraction of Cellulosic Fibers from Vegetable Material. U. Pomilio. Brit. pat. 489,302 (Jan. 23, 1937).—Vegetable materials (straws, grasses) are treated successively with aqueous sodium hydroxide (not more than 1% solution) at 75° to 100°C. for 1 to 4 hrs. (1 part by weight of straw to 3 parts of solution), then with moist chlorine gas (4 to 5 parts by weight of chlorine to 100 parts of straw) diluted with air (0.5 to 1:1 by volume) and finally with very dilute aqueous sodium hydroxide (not more than 0.2% concentration; 5 to 20 parts by weight of solution to 1 part of straw), both at room or lower temperature, the quantiites of reagents, which are prepared by electrolysis of aqueous sodium chloride, being sufficient to remove only part of the noncellulosic constituents.—A.P.-C.

Expressing Liquid from and Disintegrating Fibrous Material. Matthew J. Stacom. Brit. pat. 492,524 (Sept. 16, 1938).—In the production of fibrous cellulose for the manufacture of paper, rayon, etc., pine or fir wood, banana stalks, henequen, hemp, grasses, sugar cane, corn stalks, tobacco, bamboo, palm leaves, rhubarb, etc., are crushed while green, or moistened with hot or cold water, dilute sodium hydroxide, etc., under great rolling pressure to separate sap, resins, sugar, medicinal substances, carbohydrates, oils, albuminoids, alcohols, amides chlorophyll, etc., and reduce the fibers to a dry, friable mass that may be given subsequent chemical treatment as by a soda, sulphate or sulphite process, or may be further dried by heat, exposure to sunshine, etc., or pulverized, screened, sorted, etc. Apparatus is described. Insulating board may be made proof against attack by termites, vermin, etc., by adding, e.g., to banana stalk fiber, fiber from timboo root, derris root, etc., containing natural insecticides.—A.P.-C.

Purifying Tall Oil. Edward M. Frankel and Arthur Pollak, assignors to West Virginia Pulp and Paper Company. U. S. pat. 2,143,345 (Jan. 10, 1939).—The crude substantially anhydrous tall oil is subjected to a continuous flash evaporation under high vacuum in the absence of steam or other added carrier gas or vapor to separate the tall oil into a vapor rich in abietic and fatty acids and a liquid residue rich in pitch. The vapor is

separated from the residue and condensed, the distillate so obtained being substantially free from tar or other substances inhibiting crystallization of abietic acid. The distillate is cooled and the abietic acid is allowed to crystalline and the crystals are separated from the distillate. This leaves a distillate rich in fatty acids.—A.P.-C.

Production of Pure Cellulose from Plants Containing Silica, More Particularly from Straws. J. W. Eggert. Belg. pat. 429,558 (Sept. 30, 1938).—The straw is cut into lengths corresponding to the distance between the nodes, treated at 120°C. with water containing a reducing agent, then at 150°C. with caustic soda and finally with chlorine. The chlorinated lignin is treated with sodium sulphite and removed, and the remaining cellulose mass is treated with caustic soda.—A.P.-C.

Alkaline Pulping Process. Kurt Hess and Max Ulmann. Brit. pat. 493,828 (Oct. 14, 1938).—Bleachable straw halfstuffs and straw pulps are made by boiling with liquors containing slaked lime, draining and passing the pulp directly to a Hollander, rod mill or edgemill, etc., where it is unraveled and rinsed till the wash water contains little or no sediment on standing.—A.P.-C.

Pulp from Flax or Hemp Tow. Champagne Paper Corp. Brit. pat. 492,219 (Sept. 16, 1938).—The rags are cooked in a digester with a solution formed from water about 2.5 to 4.0 times the dry weight of the rags, sulphur 1 to 4 per cent, lime 4 to 10 per cent and sodium carbonate 12 to 20 per cent of the dry weight of the rags; the cooked rags are washed to remove excess shive and water-soluble impurities, and may then be bleached.—A.P.-C.

Pulp from Linen Rags. Champagne Paper Corp. Brit. pat. 492,220 (Sept. 16, 1938).—Flax or hemp tow is cooked in a digester with 2.5 to 4.0 times its dry weight of water and with 14 to 20 per cent of sodium hydroxide and 1 to 4 per cent of sulphur on the dry weight of the two. The material is then washed and may be bleached.—A.P.-C.

Atomizer, Especially for the Atomizing of Pulp Waste Liquors in a Combustion Oven. Canada Paper Company, Montreal & G. Tomlinson. Ger. pat. 660,161 (May 15, 1936).—J.F.O.

Process for the Separation of Soap from Black Liquor by the Cooking of Pulp According to the Sulphate or Soda Process. Bergstrom & Cederquist, Stockholm. Swed. pat. 90,020 (Feb. 9, 1935). The soap is separated before the final separation of the liquor and stock and this takes place in the digester or in special wash apparatus. —J.F.O.

Process for the Manufacture of Unactivated Carbon from Waste Pulp Liquors. Newspaper, Pulp and Wood Export, Ltd., Belg. pat. 425,105 (Jan. 31, 1938).—The waste liquor is rid of substances that are useless for the formation of carbon by treating with caustic alkalies and alkali carbonates. The mixture is evaporated, dried, calcined in an inert atmosphere, crushed and washed to recover the alkalies.—A.P.-C.

Use of Black Liquor in Bituminous Emulsions. Wm. N. Davis, Orville E. Cushman and Joseph E. Fratis, assignors to Standard Oil Co. of California. U. S. pat. 2,132,607 (Oct. 11, 1938).—An oil-in-water type bituminous emulsion, such as one of asphalt, normally unstable against breakdown when mixed with 10 per cent of its weight of portland cement, is stabilized against such breakdown by admixture with a small proportion of sulphate black liquor.—A.P.-C.

Machinery

Automatic Regulator for Paper Machine Driers. Société Française des Régulateurs Universels Arca. Fr. pat. 48,002; addn. to 753,634.—In the device described in the main patent, the regulating action is obtained through the variations in tension of the sheet resulting from variations in moisture content. According to the present invention a similar device is used, but the regulating action is obtained through the variations in the temperature of the sheet resulting from variations in moisture content, either alone or in conjunction with variations in tension.—A.P.-C.

Drive for Paper Machine Driers. J. Bertram and Son, Ltd., and D. H. Thomson. Brit. pat. 476,-507.—A separate enclosed worm or spiral bevel wheel gear is provided for each cylinder, connected by enclosed shafting, arranged substantially outside the zone of the paper lead and the cylinder bearings. The driving shaft for the upper cylinders may be located above and that for the lower cylinders below, the bearings of the felt rolls, the upper and lower shafts being connected by an enclosed vertical shaft and spiral bevel or worm gearing.—A.P.-C.

Consistentcy Regulator. Thames Board Mills. Fr. pat. 823,854.—The stock is made to pass through an open trough, and the difference in the pressure of the stock at two distant points in the trough is utilized to operate the valve in the dilution-water line.—A.P.-C.

Miscellaneous

Elimination of Slime Accumulation in the Manufacture of Paper Pulp. Charles A. Sankey, assignor to Ontario Paper Company, Ltd. Can. pat. 376,445 (Sept. 13, 1938).—To limit the growth of organisms causing slime, the temperature is maintained at 45° C. or higher in those parts of the system immediately preceding the point of flow of furnish to a paper-forming device.—A.P.-C.

Testing the Amount of Fibers in the Waste Water of Pulp Mills. C. B. Thorne. Brit. pat. 489,779 (Feb. 6, 1937).—An automatic filter and automatic weigher are combined for continuously effecting the test.—A.P.-C.

Purification of White-Water. I. Wallquist. Brit. pat. 488,151 (Nov. 17, 1937).—An endless filter cloth runs over two (or more) previous drums; the layer of fibers deposited on the first drum from the white-water is left undisturbed until after passage over the second (and subsequent if any) drum, where the water is re-filtered.—A.P.-C.

Method of Packaging Paper. Francis S. McDonnell. U. S. pat. 2,119,956 (June 7, 1938).—The advantages of skid packaging are maintained, but at the same time the sheets are so packaged and protected that buckling or dishing or other distortion of the sheets is substantially prevented. This is effected by individually wrapping (preferably in a waterproof wrapper) a fractional part of the paper is situ on the skid, first laying the wrapper on the skid, placing thereon the desired amount of paper, and then bringing the wrapper up and about the paper, preferably in such a manner that the package can be readily opened at the top, and then similarly wrapping successive further fractional quantities until the desired quantity of paper has been wrapped. (Cl. 93-2).—A.P.-C.

The Fluorescence Size Test, An Improved Method And A New Instrument for Measuring the Water Resistance of Paper*

By J. A. Van den Akker,[1] Philip Nolan,[2] A. C. Dreshfield,[3] and H. F. Heller[4]

Abstract

Experiments leading to the development of a new method for measuring the water resistance of paper are described. The transudation of water is detected by a fluorescent indicator. The fluorescent indicator employed exhibits strongly a so-called "concentration effect." This characteristic of the fluorescent indicator distinguishes it from other indicators of transudation of water, mainly as regards error due to water vapor permeability of the paper under test. Data and observations are given which indicate that transudation times obtained with the fluorescent indicator are subject to negligible error due to water vapor. The development of an objective method involving photoelectric recording of the fluorescence intensity is given, and data on the influence of a number of variables are presented. Using the photoelectric equipment, it was found that the typical probable error in the mean of ten observations was 1.5 per cent.

The problem of measuring the resistance of paper to the penetration of water has attracted the attention of papermakers for many years. Scores of "size tests" have been developed for the measurement of this property of sized papers. Most of the existing methods have been described by Carson *(1)*, to whom we are indebted for the dry-indicator method and the curl test which bears his name. The large number of size tests still in use attest to the intangible nature of "degree of size," and to the general feeling among the technical men of the paper industry that water resistance is not yet being measured correctly by any method.

Many size tests involve the use of chemical solutions, and, for obvious reasons, tests performed with them are apt to produce false comparisons or rankings. It is for this reason that methods involving pure water *(2, 3, 4)* have received most serious attention in recent years. Outstanding in popularity among these latter methods is the TAPPI dry-indicator test *(2)*. A practical difficulty commonly encountered in the use of this test is the highly subjective nature of the end-point. A number of observers may train themselves individually to obtain consistent results, but if they are not trained together and therefore do not have a common criterion for judgment of the end-point, their data will not be in agreement.

An equally serious fault of the dry-indicator test is associated with the strongly hygroscopic nature of the indicator. Water vapor preceding the advancing water is adsorbed by the indicator, and the apparent size time may be very appreciably less than the true time for transudation of the liquid water. Truly enough, water has penetrated through the sheet, even though largely in vapor form in some cases, but this situation is to be regarded as unsatisfactory from at least a fundamental viewpoint. Water vapor permeability (for which methods of measurement exist) and water resistance should be regarded as two different properties, and methods of measurement for each property should be in existence. A practical manifestation of this basic defect of the dry-indicator method is the fact that the size times of a series of papers, having a degree of sizing varying from moderate to hard, may fall in a rather narrow range, as, for example, from 40 to 60 seconds.

A noteworthy and successful attempt was made by Grant *(5)* to reduce the personal error in the detection of the end-point of the dry-indicator method. Grant's modification of the dry-indicator test apparently does not appreciably modify the size times obtained. The end-point is sharper and more definite, but the size time is subject to the water vapor error.

Feeling that the TAPPI dry-indicator and other existing tests left much room for improvement, the Paper Makers Chemical Division of the Hercules Powder Company and The Institute of Paper Chemistry entered upon a cooperative research, sponsored by the former, the objective of which was the development of an improved size test. It is the purpose of this article to present the more important results of this work.

Development of the Fluorescence Size Test

Work leading to the present fluorescence size test started with the Grant *(5)* modification of the dry-indicator test. Grant prepared a fluorescent indicator composed of a 0.5 per cent dry mixture of rhodamine 6GX dye in powdered sugar. This end-point detector is viewed in filtered ultraviolet light (popularly referred to as "black light"). At the end-point, the intensity of the fluorescent light increases from a low to a high value, and the color of the final, bright fluorescent light might be described as yellow-orange. The functioning of Grant's detector depends upon the property of the rhodamine dyes to exhibit a marked change in fluorescence upon going into aqueous solution. When dry, the fluorescent light from rhodamine 6GX is of feeble intensity and dull red color; however, when in solution, the fluorescent light is brilliant and of yellow-orange color.

It seemed clear from our initial tests, however, that this indicator was objectionably sensitive to water vapor. Qualitative tests verified this objection. In the first experiment a small amount of the Grant indicator was sprinkled over the central portion of a watch

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Syracuse, Syracuse, N. Y., September 12-14, 1939.

[1] Research Associate, The Institute of Paper Chemistry, Appleton, Wis.
[2] Research Assistant, The Institute of Paper Chemistry, Appleton, Wis.
[3] Member TAPPI, Director of Operations, Paper Makers Chemical Division, Hercules Powder Company, Wilmington, Del.
[4] Paper Makers Chemical Division, Hercules Powder Company, Wilmington, Del.

glass; a circular set of droplets of water was then placed upon the watch glass, in such fashion that the droplets girdled the indicator, but were everywhere at least several millimeters from the dye. The watch glass was then covered with a second glass and viewed in ultraviolet light. In one minute the peripheral part of the indicator fluoresced brightly, and in four minutes all of the indicator fluoresced with the characteristic brilliance and color of the end-point. A similar experiment carried out with the TAPPI indicator (viewed in ordinary light) resulted in a fairly typical end-point in one minute. Now an ordinary sheet of sized paper is quite permeable to water vapor. Measurements upon water vapor permeability of a number of nonmoistureproof papers and calculations show that the length of path of quiet air equivalent in water vapor permeability to a typical sheet of paper is only of the order of a few millimeters *(6)*. In view of the fact that the diffusion distance through the air in the lens-shaped space between the watch glasses was of this order, this qualitative test shows that the indicator is not only sensitive to water vapor, but that advancing water vapor in an actual test must materially shorten the size time.

In a further test, the Grant indicator was sprinkled on a sheet of extremely hard sized groundwood-sulphite paper, and the sheet was placed over the mouth of a wide-mouthed bottle; the bottle had been filled with water to a point about ⅛ inch below the mouth, and the rim had been carefully dried so that no liquid water came in contact with the sheet. An inverted watch glass was placed over the sheet, and an end-point was actually observed and determined. This sheet was so well sized that a flotation time of three weeks was insufficient to produce observable wet spots. The size time observed for the end-point brought about by water vapor which had diffused through a distance of about ⅛ in. of air, and through the paper sheet, was about 14 minutes. The TAPPI and Grant size times for this sheet were both less than one minute.

Attempts were made to obtain end-points using unadulterated rhodamine 6GX sprinkled on various papers. It was found that the fluorescence of the dye remained a dull red after the water had obviously penetrated the paper. Visual examination in ordinary light showed that the small dye clusters were actually wet, i. e., a liquid surface could be seen. The explanation of this phenomenon is that rhodamine 6GX is one of several dyes which do not exhibit a marked change in fluorescence characteristics on going into solution *until the concentration is below a more or less critical value.* No end-point was observed when the pure dye was sprinkled on test specimens, because, after transudation, the amount of water available was insufficient for the dilution necessary to produce the brilliant yellow-orange fluorescence.

It was then reasoned that the dye particles should be applied to the surface of a test specimen in such fashion that, at any point, the water available per particle of dye, after transudation, is sufficient to produce the state of dilution which gives rise to the characteristic bright fluorescence. Accordingly, the dye was lightly brushed upon the surface of a number of specimens with a camel's hair brush, and satisfactory end-points were obtained. While the kind of dye has been changed since this stage in the development of the fluorescence size test, the technique of applying the dry dye with a camel's hair brush has been retained. Apparently, the brushing breaks up small clumps of dye particles and distributes the small particles evenly and sparingly. Only enough dye is brushed on the surface to impart a just visible reddish tint.

Special tests on the influence of water vapor on the new end-point (hereinafter referred to as "F.S.T." —Fluorescence Size Test) showed that any effect, if it existed at all, was inappreciable. This was further attested to by experiments to be described later, and the fact that size times obtained on hard sized papers were very much longer than the corresponding TAPPI size times. On inspecting a sheet which had been exposed to nearly saturated water vapor, but not a liquid water, for a fairly long period of time, it could be seen that the surface, to which the dye had been added, was wet, and very small globules of concentrated dye solution could be seen. Again, the concentration of dye in these small droplets was too high for the characteristic bright fluorescence, and the only fluorescence which could be seen, except for an occasional point where the dilution happened to be high, was the dull red fluorescent light characteristic of the dry dye. An attempt to obtain the F.S.T. time for the extremely hard sized groundwood-sulphite paper, already referred to, had to be abandoned after a reasonable period of time, because a proper end-point failed to materialize. For convenience of expression, we shall, hereafter, refer to the important characteristic of the dye to show marked change in fluorescence only when the concentration in aqueous solution is sufficiently low, as the "concentration effect."

The dependence of the Grant test on water vapor was strikingly shown by a series of determinations in which the percentage of rhodamine 6GX in the mixture of this dye and powdered sugar was varied through wide limits. The results are shown in Table I and plotted in Fig. 1.

From inspection of these data, it seems clear that the highly hygroscopic nature of the sugar had predominant influence for the case of mixtures containing small amounts of dye. As the amount of dye was increased, the concentration effect became of increasing importance, until, at a percentage of dye

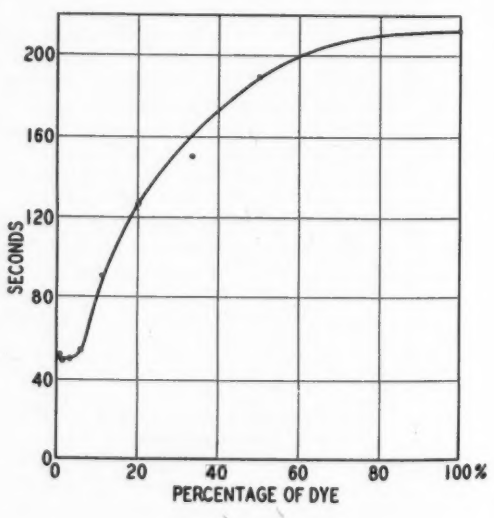


FIG. 1.
Variation of apparent transudation time with percentage of Rhodamine 6GX dye in the dye-sugar mixture.

TABLE I.—THE INFLUENCE OF SUGAR CONTENT ON SIZE TIME

Dye, per cent	Time, seconds
0.775	52
1.54	49
3.03	50
5.88	54
11.1	91
20.0	126
33.3	150
50.0	189
100.0*	212

* Applied with camel's hair brush.

somewhat in excess of 50 per cent, the size time became rather independent of sugar content. It is apparent that a substantial part of the four-fold increase in size time on going from Grant's mixture to the pure dye, applied with a camel's hair brush, is due to the influence of water vapor. It is of interest to note that the TAPPI size time for this paper (a bond paper) was 39 seconds.

Nature of the Visually Determined F.S.T. End-Point

During the course of an F.S.T. determination, which is carried out in the dark, or in a small box equipped with a slot for viewing, nothing except the feeble fluorescence of the test specimen and the dull red fluorescence of the dye is seen until a short time prior to the end-point, when a number of isolated points or "stars" of brilliant yellowish color become clearly visible. These isolated points of fluorescent light are the precursors of the end-point. At the end-point, these "stars" become very numerous, and, more important, the surface brightness over a substantial portion of the treated area becomes rather uniform. When this test was used in the early studies, the time was called when approximately half of the treated area fluoresced with uniform surface brightness. In view of the more recent improvements in the test, this description of the visual end-point is given only for the purpose of acquainting the reader with the means for obtaining the earlier data reported in this paper. The viewing box used in much of the earlier work is shown in Fig. 2.

Examination of Other Dyes

After a number of F.S.T. times had been obtained with the rhodamine 6GX dye, it became apparent that, for certain hard sized papers, the end-point was almost too weak to be satisfactory, and, in the case of one slack sized paper, no end-point whatever was visible. In view of these findings, a number of dyes were investigated. The requirements laid down for a satisfactory dye were:

The indicator must give a satisfactory end-point on all papers.
The end-point fluorescence must be bright.
The dye must exhibit the concentration effect, i.e., the end-point must not be appreciably affected by transmitted water vapor.
The change in color of the fluorescent light must be decisive.
The end-point must be as sharp as possible, consistent with the known irregular way in which transudation of paper takes place.
The end-point fluorescent color should preferably be different from that of most papers.

A dye which appears to meet these requirements very satisfactorily is uranine B (Heller and Merz). The end-point fluorescence is a bright yellow of very high intensity, and the fluorescence of the dry dye is like that of the rhodamine 6GX, a very dull red. Uranine B is hygroscopic and must, therefore, be kept in a dry atmosphere to keep the dye in a fluffy condition and to prevent agglomeration of the particles. The dye can be placed in an open container, however, if an incandescent lamp or small electric heater is used to keep it warm.

Because of the hygroscopic nature of uranine B dye, careful tests were made to ascertain the influence of water vapor on the end-point. All tests have shown or indicated that the influence of water vapor is inappreciable. This is due to the fortunate circumstance that this dye exhibits a very strong concentration effect. By means of a photoelectric setup, the intensity of fluorescent light from a solution of uranine B dye, 1 mm. thick, was measured for various concentrations. The intensity was found to be extremely weak for all concentrations ranging from a thick paste down to a concentration of only 5 per cent; at a concentration somewhat below 5 per cent, the intensity became appreciable, and, as the concentration was further lowered, the intensity rose rapidly with decreasing concentration to a maximum for a concentration of 0.25 per cent; as the concentration was further reduced, the intensity fell off slowly.

When one considers the mechanism of transfer of water through a paper sheet, it is realized that the concentration effect is very important. Let us suppose that a certain dye is not hygroscopic and does not exhibit a concentration effect. During the course of transudation, fibers in the top surface of the sheet adsorb water from the vapor phase, and dye particles at certain points would be taken into solution, whereupon the characteristic change in fluorescence would occur. If, however, the dye exhibits a strong concentration effect, the water adsorbed from the vapor will not be sufficiently plentiful for the characteristic change in fluorescence, even though the dye be hygroscopic. This was convincingly shown by several experiments with papers to which uranine B dye had been applied by brushing, in which the test specimens were placed immediately over, but not in contact with, water as previously described. After a period of many minutes only a few isolated "stars" could be seen. At these points the water locally adsorbed by both fiber and dye was sufficiently large, and the particles sufficiently small, for the concentrations at those points to be less than the critical concentration of about 5 per cent. Immediately after prolonged exposure, the test specimens were brought into contact with the water surface, and the size times were determined. The surprising result obtained was that the size times were substantially the same as those for fresh specimens. It might be supposed that a preconditioning of the paper to very humid air would actually reduce

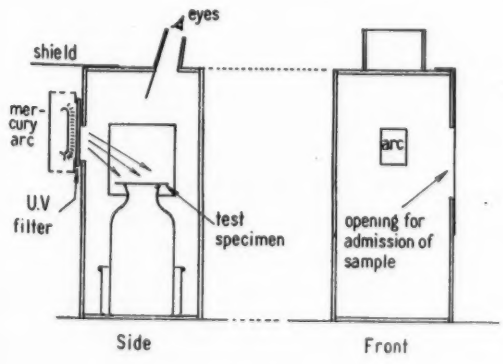


FIG. 2.
Viewing box for visual F.S.T. determinations.

the water resistance of the paper. Work, to be described later, on the influence of relative humidity of the conditioning atmosphere shows, however, that relative humidity does not have a large effect. The point of importance is that preexposure of the paper to a very humid atmosphere with the dye applied would markedly reduce the subsequently observed size time if water vapor had an appreciable influence on the end-point.

Perhaps the most convincing evidence favoring the view that the uranine B end-point is not affected by water vapor is obtained by microscopic examination of the surface of a hard sized specimen by fluorescent light during the transudation of water. Until the end-point commences, virtually no characteristically bright fluorescent light is observed. During the end-point stage, however, individual fibers can be seen to light up rather suddenly with the characteristically bright fluorescence; in the space of about a second, the brilliantly fluorescing solution can be seen to travel down the length of a fiber. It is evident that this phenomenon occurs when the advancing water meets the superficial fibers of the sheet.

It should be emphasized that the amount of dye applied to a test specimen is very small. In the earlier tests where the visual end-point was used, it is estimated that the amount of dye applied was only of the order of 10 micrograms per square centimeter. The weight of dye applied was measured by spectrophotometric means.

Comparison of Visual F.S.T. with TAPPI, Valley, and Currier

Test data obtained with uranine B dye and visually determined end-point are compared with three tests in current use in Table II. Individual determinations are given to show the nature of typical deviations of individual values from average. It will be seen that the probable errors are satisfactorily small; however these probable errors are considerably smaller than the differences between different operators' determinations (personal error will be discussed later). Comparison of the data obtained with the four tests shows that correlation between any two tests is poor. The TAPPI and visual F.S.T. size times are in rough agreement where the latter are smaller than about 30 seconds. This has been confirmed in many subsequent tests and is explained by the fact that the influence of water vapor on the TAPPI test is small where the degree of size is low. As a general rule, the F.S.T. size times for slack sized papers are less than the corresponding TAPPI size times. This is explained by the fact that the uranine B dye, present in minute quantities, is a rapid indicator of the transuded water, whereas the TAPPI dry-indicator is applied in larger quantities, and requires more water for the end-point. As one would expect, the difference between TAPPI and F.S.T. size times decreases as the degree of size increases, and passes through zero in the neighborhood of 30 to 40 seconds, and then increases fairly rapidly in the negative direction as the F.S.T. size time increases. For the samples listed in Table II, the maximum F.S.T. value is 189 seconds (butchers wrap), and the corresponding TAPPI value is only 50 seconds.

After the data presented in Table II were obtained, an attempt was made to correlate differences between the F.S.T. and TAPPI size times with water vapor permeability. For this purpose, Vapometer runs were made on a series of 72 samples covering a wide range in basis weight, degree of size, and type of paper. All samples were nonmoistureproof. The samples were arranged on the basis of the TAPPI test in one case and on the basis of the F.S.T. test in another case. Fluctuations of F.S.T. size times in the first case were compared with the corresponding differences in water vapor permeabilities, and similar differences were compared in the second case. A very rough but definite correlation was found, in which an increase in F.S.T. size time was accompanied by an increase in water vapor permeability when the change in TAPPI size time was inappreciable, and, when the change in F.S.T. size time was nil, an increase in TAPPI size time was accompanied by a decrease in water vapor permeability. It was felt that better correlation would have been obtained if the Vapometer method had been more sensitive to differences in permeability of nonmoistureproof papers; the diffusion resistance of the air in the Vapometer cups was actually larger than that of the paper (the whole range of vapor transmission rates was only that from 0.29 to 0.39 grams loss of weight of the cups per three hours, in spite of a basis weight range from 9 to 150 lb.).

Variation of Size Time with Basis Weight

An important test of the validity of a method for measuring the water resistance of paper lies in the relationship of size time determined by that method and sheet caliper. The application of capillarity theory or of dimensional analysis leads to the result

TABLE II.—COMPARISON OF URANINE B SIZE TIMES WITH TAPPI, VALLEY, AND CURRIER TIMES. PROBABLE ERRORS ARE EXPRESSED IN SECONDS.

Sample no.	Type of paper	Wire side up (seconds)							Felt side up (seconds)											
							Ave.	Prob. error						Ave.	Prob. error	Grand ave.	Prob. error	TAPPI	Valley	Currier
10602	litho	10	10	10	11	10	10.2	0.13	13	14	15	12	11	13.0	0.5	*11.6*	0.21	14.3	3.0	8.5
10607	litho	55	56	58	61	65	59.0	1.3	65	70	73	66	61	67.0	1.5	*63.0*	0.94	39.5	39.0	38.5
10635	litho	39	36	42	51	47	43.0	2.0	51	56	48	57	44	51.2	1.8	*47.1*	0.97	33.5	31.0	34.5
10637	litho	76	72	79	71	77	75.0	1.2	85	100	105	101	93	96.8	2.6	*85.9*	1.3	38.5	161.0	48.0
10663	litho	49	54	50	54	49	51.2	0.9	75	62	64	74	51	65.2	3.1	*58.2*	1.3	43.0	20.5	29.0
10664	litho	114	100	95	110	..	105.0	3.5	54	52	49	50	..	51.3	0.85	*78.5*	1.5	42.5	20.5	18.0
15	bond	17	16	16	17	15	16.2	0.27	19	16	16	15	14	16.0	0.5	*16.1*	0.26	20.7	2.0	5.5
16	bond	28	31	32	33	32	31.2	0.57	31	32	39	36	31	33.8	1.2	*32.5*	0.6	26.5	13.0	30.7
A	bond	30	33	31	35	31	32.0	0.7	32	32	30	28	32	30.8	0.66	*31.4*	0.45	25.5	18.5	38.5
B	bond	52	49	52	52	49	50.8	0.6	47	50	48	50	47	48.4	0.54	*49.6*	0.38	34.5	18.5	50.5
C	bond	89	92	94	92	80	89.4	1.7	90	87	78	86	85	85.2	1.3	*87.3*	1.0	51.0	73.0	69.3
93	kraft	160	154	168	170	181	167.0	2.4	159	164	166	160	156	161.0	1.4	*164.0*	1.3	65.0	127.0	78.0
35	butcher wrap	179	275	183	148	117	180.0	16.0	310	197	184	149	148	198.0	19.0	*189.0*	12.0	50.0	53.0	48.5
32	butcher wrap	99	91	108	115	109	104.0	3.2	97	105	125	120	93	108.0	4.9	*106.0*	2.7	35.0	44.0	47.0
VIII	coat. book	28	27	27	27	26	27.0	0.17	27	25	30	24	28	26.8	0.77	*26.9*	0.31	...	...	...
4009	mimeo	66	62	78	75	71	70.4	2.2	76	72	79	78	74	75.8	0.94	*73.1*	1.1	47.5	68.5	63.0
4010	mimeo	44	49	49	57	51	50.0	1.3	46	39	51	49	48	46.6	1.4	*48.3*	0.90	35.5	37.5	38.5
4011	mimeo	37	46	48	51	46	45.6	1.5	50	59	54	51	58	54.4	1.4	*50.0*	0.97	34.0	116.0	58.5
4050	mimeo	6	6	5	4	4	5.0	0.3	4	3	3	3	3	3.2	0.13	*4.1*	0.14	3.0	0.4	1.0
4051	mimeo	69	89	71	70	53	70.4	3.2	64	68	73	65	70	68.0	1.2	*69.2*	1.5	45.5	56.0	57.5
4052	mimeo	55	49	62	58	68	58.4	2.2	66	59	58	66	62	62.2	1.3	*60.3*	1.2	29.5	6.0	40.5

that transudation time should be proportional to the square of sheet caliper *(7, 8)*. This assumes, of course, that the paper is homogeneous and that the degree of size in the various sheets is the same. If the end-point of the method is subject to the water vapor error or other source of error, the apparent transudation time will not bear this relationship with caliper, but the exponent will have some value different from 2.0. In general, $t = k\ W^m$, where t is transudation time, k is a constant, W is sheet weight (which can be taken as approximately proportional to caliper), and m is an exponent to be determined empirically. The effect of water vapor would be to make m smaller than the ideal value of 2.0.

A practical difficulty in applying this test is that of obtaining ideal sets of paper, each set being a series of papers of identical structure and degree of sizing and differing only in basis weight. It is, apparently, impossible to fabricate sheets of different weight but of identical degree of sizing and formation of fibers; for example, it is often the practice to impart a higher degree of sizing to light weight papers. Nineteen sets of paper were gathered. Each set consisted of papers of several basis weights made on the same machine and supposedly similar in all properties. For the reasons given above, tests performed with these papers should not be regarded as crucial but mainly of comparative value. The F.S.T. and TAPPI size times, together with nominal basis weight, sheet weight, and caliper are given in Table III.

In the analysis of the data presented in Table III, the weight of a 3 × 3-in. square of the paper was used instead of the nominal basis weight. For each set of papers, the logarithm of the size time was plotted against the logarithm of sheet weight. An illustrative chart (for the first set given in Table III) is reproduced in Fig. 3. As a general rule, a straight line fitted the points obtained by both the F.S.T.

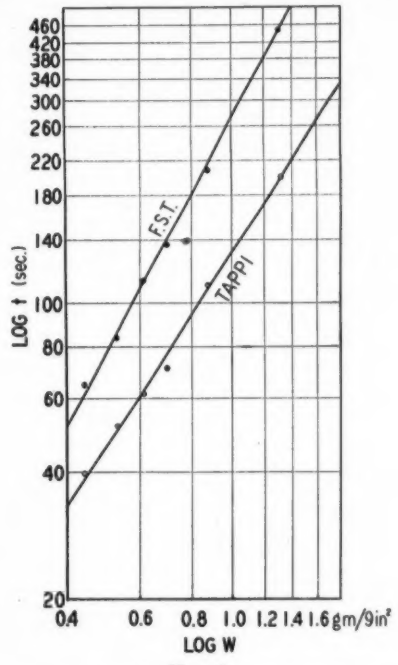


FIG. 3.
Curves illustrating the linear relationship between the logarithm of size time and the logarithm of basis weight.

TABLE III—THE RELATIONSHIP BETWEEN BASIS WEIGHT AND F. S. T. AND TAPPI SIZE TIMES

Institute File No.	Classification, per cent	Basis weight, pounds	Weight 3 × 3 in. sq., grams	Caliper, inches	Uranine B time, sec.	TAPPI time, sec.
83849	72 S	50	0.4425	0.0035	64.6	39.3
83850	72 S	60	0.5315	0.0041	82.9	51.4
83851	72 S	70	0.6143	0.0049	112.1	62.3
83852	72 S	80	0.7015	0.0057	136.7	70.3
83853	72 S	100	0.8762	0.0069	206.1	111.1
83854	72 S	150	1.3185	0.0109	442.4	199.8
83855	100 S	13	0.2905	0.0025	31.8	26.3
83856	100 S	20	0.4488	0.0038	68.6	42.4
83857	100 S	24	0.5213	0.0042	93.7	61.4
83858	100 R	28Y	0.6178	0.0045	77.3	52.7
83859	100 R	32Y	0.6813	0.0050	89.8	64.2
83860	100 R	36Y	0.7928	0.0059	112.4	77.5
83861	100 R	13	0.2950	0.0026	20.0	18.6
83862	100 R	24	0.5690	0.0038	62.4	46.4
83863	100 R	28	0.6185	0.0045	85.6	58.6
83864	50 R; 50 S	24	0.5435	0.0039	79.4	51.0
83865	50 R; 50 S	32	0.7147	0.0051	116.6	77.9
83866	50 R; 50 S	36	0.8313	0.0059	156.7	97.4
83867	30 R; 70 S	9	0.2103	0.0019	15.0	15.8
83868	30 R; 70 S	16	0.3705	0.0029	42.9	35.3
83869	30 R; 70 S	13	0.2788	0.0023	25.9	23.0
83870	30 R; 70 S	20	0.4092	0.0034	52.5	39.8
83871	30 R; 70 S	24	0.5175	0.0041	75.5	57.0
83903	mimeo, bond (A)	80	0.717	0.0075	149.4	90.4
83904	butchers paper	28	0.276	0.00248	56.2	42.4
83905	butchers paper	37	0.369	0.0035	99.4	62.8
83906	offset	60	0.508	0.0039	110.9	61.4
83907	offset	70	0.600	0.0045	173.1	87.1
83908	offset	80	0.671	0.0052	176.5	91.6
83909	offset (A)	60	0.525	0.0040	92.5	63.5
83910	offset (A)	70	0.626	0.0050	120.2	87.4
83911	offset (A)	80	0.715	0.0057	150.6	89.7
83912	striped sul. wrapper	30	0.306	0.0025	39.5	32.4
83913	striped sul. wrapper	34	0.347	0.0030	45.7	43.1
83914	striped sul. wrapper	35	0.355	0.0031	53.3	37.8
83915	striped sul. wrapper	40	0.414	0.0037	83.7	41.9
83916	striped sul. wrapper	42	0.439	0.0041	50.1	40.4
83917	striped sul. wrapper	44	0.452	0.0040	49.9	37.7
83918	striped bl. sul. wrapper	34	0.356	0.0030	61.6	41.3
83919	striped bl. sul. wrapper	40	0.419	0.0037	89.2	47.3
83920	kraft bag stock A	25	0.242	0.0022	45.7	23.4
83921	kraft bag stock A	30	0.310	0.0029	69.1	32.3
83922	kraft bag stock A	35	0.357	0.0037	90.7	39.8
83923	kraft bag stock A	37	0.373	0.0039	90.6	40.9
83924	kraft bag stock A	40	0.403	0.0040	112.8	46.0
83925	kraft bag stock A	42	0.431	0.0043	131.8	51.7
83926	kraft bag stock A	50	0.520	0.0046	172.8	67.7
83927	kraft bag stock A	55	0.560	0.0054	195.9	78.8
83928	kraft bag stock A	60	0.630	0.0060	201.4	90.9
83929	kraft bag stock B	25	0.249	0.0023	45.8	21.8
83930	kraft bag stock B	30	0.309	0.0028	71.0	34.7
83931	kraft bag stock B	40	0.405	0.0037	110.4	46.6
83932	kraft bag stock B	50	0.528	0.0042	140.2	59.6
83933	kraft bag stock B	60	0.610	0.0045	210.4	74.4
83934	kraft bag stock B	65	0.651	0.0055	258.5	87.1
83935	kraft bag stock B	70	0.718	0.0059	308.9	102.0
83936	kraft bag stock B	75	0.772	0.0060	320.5	99.0
83937	B-grade Eng. fin.	40	0.332	0.0021	18.0	22.5
83938	B-grade Eng. fin.	50	0.418	0.0029	34.2	31.0
83939	B-grade Eng. fin.	60	0.515	0.0033	8.6	12.6
83940	D-grade Eng. fin.	40	0.350	0.0022	8.8	13.5
83941	D-grade Eng. fin.	50	0.436	0.0030	18.9	23.5
83942	D-grade Eng. fin.	60	0.536	0.0038	29.7	34.8
83943	No. 4 coating raw stock	43	0.377	0.0032	58.5	41.9
83944	No. 3 coating raw stock	46	0.398	0.0033	34.5	33.8
83945	No. 4 coating raw stock	48	0.423	0.0036	68.6	48.5
83946	No. 3 coating raw stock	51	0.446	0.0040	49.4	43.1
83947	No. 3 coating raw stock	58	0.489	0.0042	58.7	50.0
83948	No. 2 coating raw stock	68	0.600	0.0048	88.3	52.3
83949	No. 2 coating raw stock	114	1.034	0.0090	207.8	110.7
83950	No. 2 folder coating raw stock	51	0.457	0.0038	56.3	49.8
83951	No. 2 folder coating raw stock	88	0.772	0.0062	110.1	76.1

and TAPPI tests fairly accurately, and, as may be seen from inspection of the data in Table III, the F.S.T. size times were appreciably longer than the corresponding TAPPI size times. The linear relationship found showed that, for each test, the law $t = k\ W^m$ was obeyed. The slope of the straight line gives at once the exponent m. In this way it was found that the average exponent for the fluorescence size test was 1.87, while that for the TAPPI test was 1.43. The average F.S.T. value for m differs from the ideal value of 2 by 7 per cent, while the TAPPI value differs from the ideal value by 28 per cent. The greater defect in the TAPPI value of m is taken as further evidence that the dry-indicator test is subject to an appreciable water vapor error.

The relatively small defect of 7 per cent in the case of the F.S.T. test might be due to a number of factors, chief among which is the tendency of lighter weight papers to be slightly harder sized; it is possible that the F.S.T. test is subject to a slight water vapor error, although more recent tests of the size time-basis weight relationship performed with the improved F.S.T. test yield values of m close to the ideal value.

Personal Error in the Visual F.S.T. End-Point

Since the equipment necessary for the performance of the fluorescence size test with the subjective end-point is inexpensive, it was hoped that personal error would be adequately small. The operator who obtained all of the visual F.S.T. data could obtain reproducible results on the same sample with many days or weeks between successive readings, his error usually being of the order of 5 per cent (in average of a run of ten or more test specimens). It was felt, however, that the visual F.S.T. method would not be of the greatest value unless different operators located in different parts of the country could obtain sensibly the same results by using only written instructions. The method was tested for this requirement by calling into conference six men, only one of whom (the regular observer) knew anything about the test. They were told about the purpose and nature of the method and received only a word description of the end-point. No personal instruction with the equipment was given. They were given test specimens which had been cut from a sample in such manner that their data should have agreed. In addition, they each received a few specimens to experiment with. These operators should be regarded as inexperienced, without the advantages of personal instruction. Their results are presented in Table IV.

The results obtaind by two of the operators (nos. 1 and 5) agreed fairly well with the result obtained by no. 6 (the regular observer), but the other deviations were regarded as intolerably large. It later became apparent that operator no. 4 judged the end-point soon after the appearance of the "stars" and did not wait until half the treated area fluoresced uniformly. The other two operators apparently waited until more than half the treated area fluoresced uniformly.

TABLE IV.—URANINE B SIZE TIMES OBTAINED BY SEVERAL OBSERVERS, VERBAL INSTRUCTIONS ONLY

Observer	1	2	3	4	5	6
Date ...	6/30/36	7/2/36	7/2/36	7/9/36	7/23/36	7/23/36
	55	90.0	72	54.2	60	63 sec.
	274	94.5	82	55.8	67	70
	54	96.0	90	52.2	70	70
	66	108.5	87	65.4	75	74
	68	100.0	88	57.5	66	67
	65	91.0	80	56.6	61	69
	64	102.0	85	57.2	70	65
	66	97.0	84	57.5	66	71
	66	94.0	92	56.4	..	67
	69	106.0	90	61.8	70	75
Averages ..	63.7*	97.9	85	57.5	67.2	69.1

* Excluding 274 sec.

The Photometric Arrangement for Objective Measurement of F.S.T. Size Time

In view of the personal errors discussed in the preceding section, experimental equipment was devised which would permit the operator to arrive at the F.S.T. size time through measurement of the intensity of the fluorescent light. It was reasoned that a time could be read from a curve, giving intensity against time, which would be independent of personal error.

A schematic diagram of the optical system of the photometric apparatus is given in Fig. 4. Light from the ultraviolet lamp L_1 is filtered by the ultraviolet filter F, which passes near ultraviolet light but blocks substantially all visible light. The filtered ultraviolet light excites fluorescence in the surface U of the test specimen S. The visible fluorescent light from the specimen is received by the eyepiece, which consists of the lenses Q and R. The plane pp' is imaged by the eyepiece, and the light from the test specimen is, thereby, integrated. A salient feature of the photometric eyepiece is the fact that the half of the field of view seen by light coming from the specimen is *uniform*, in spite of very large point to point variations in the brightness of the fluorescing surface. The other half of the photometric field is illuminated by light from the comparison lamp L_2. Light from this lamp traverses three Polaroid discs A, B, and C, and then a Wratten no. 59 filter. The light then strikes the reflecting prism P and is reflected into the eyepiece. In order that the two halves of the photometric field might be matched in color as well as in brightness, the eyepiece contains a series combination of a Jena BG-18 filter and a filter composed of yellow cellophane; this combination is so placed that both beams of light pass through it.

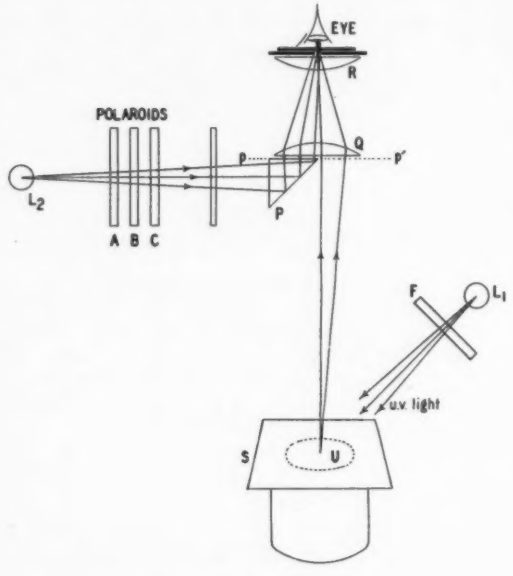


FIG. 4.
Schematic diagram of the optical system of the photometric device for measuring intensity of fluorescent light.

The purpose of the first Polaroid, A, is to adjust the order of intensity of light from the comparison lamp. This adjustment is made merely by rotating this Polaroid about the axis passing through the comparison lamp. The second Polaroid is fixed in position, and rotation of the third Polaroid is carried out to make a photometric match in the eyepiece at all times during a test. The measured intensity is proportional to the square of the sine of the angle through which the third Polaroid is rotated away from the extinction position.

The third Polaroid was linked to a simple recording mechanism so that a chart giving angle of rotation against time could be obtained, (see note). From these recordings, intensity *vs.* time curves were obtained. The typical form of the curves obtained is

illustrated in Fig. 5. This form is characterised by (a) a flat portion which actually curves down slightly due to a small decrease in natural fluorescence of the specimen as the water penetrates, (b) a region in which the curve commences to rise, (c) a steep portion, which is nearly always very linear, and (d) a region of saturation, in which the curve bends over to nearly constant intensity.

Note: In a more elaborate arrangement, a sine-squared cam could be used so that intensity rather than angle would be traced. The use of such a cam would save much time.

Various possible times could be obtained from a typical curve. Some of these are:

t_1: Time, corresponding to the intersection of the extension of the linear portion (c) above, and the line representing the background fluorescence of the test specimen. When a glass plate is placed over the specimen, t_1 is designated t_{1g}.
t_2: Time, corresponding to the intersection of the extended linear portion and the extended saturated portion.
t_3: Time, required for the intensity of fluorescence of the uranine B dye to attain half its final value.

Analysis of data on these three times showed that: (a) t_1 approximated best the previously observed data obtained with the visual F.S.T. end-point, (b) t_1 exhibited the smallest variation with varying amounts of dye applied, and (c) t_1 exhibited the smallest probable error. It is fortunate from a practical standpoint that determinations of t_1 are least time-consuming, because it is not necessary to carry a run beyond the rising linear portion of the intensity-time curve. All further work was done with t_1 or with t_{1g}.

The Influence of Air Movement Over the Test Specimen; Adoption of t_{1g} as the Best Measure of Size Time

In nearly all of the work which had been done prior to the development of the photometric method, the surface of a test specimen, away from the water, was uncovered. In the photometric apparatus, it was considered desirable to place the specimen in a small light-tight enclosure so that the equipment could be used in an illuminated room. In this enclosure, the relative humidity would be higher than that of the room because of the presence of the water cup, and it was expected that the relative humidity in the enclosure would be variable. It was reasoned that air from the room (constant humidity) should be circulated through the enclosure, and to this end a circulating arrangement was devised which directed a gentle and uniform draft of air of constant relative humidity (65 per cent) upon the test specimen.

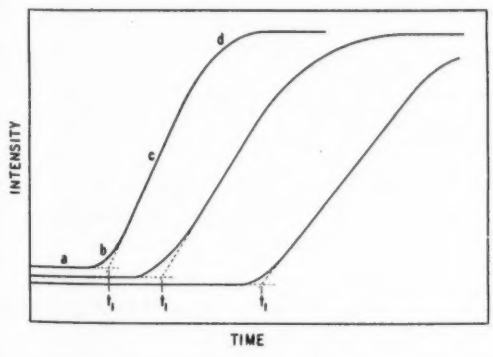


FIG. 5.
Typical curves showing the relationship between intensity of fluorescence and time, and the graphical significance of t_1 or t_{1g}.

Velocity of air movement was measured with a hot wire anemometer. It was found that, with a draft velocity of the order of one to two feet per second, no end-point whatever could be detected on many samples (hard sized). In the case of a moderately well sized sheet on which determinations could be made in the presence of the draft, transudation time in still air was 57.5 seconds, and in the presence of the draft, 73.0 seconds. It is apparent from these observations that water may evaporate from the penetrating water front at a rate comparable with the rate of penetration, in the case of hard sized papers. Where there is no draft, an appreciable film of humid air lies over the specimen, and the diffusion resistance of this film decreases to some extent the reduction in penetration rate due to evaporation.

In view of the appreciable effect of evaporation on actual penetration rate, it was reasoned that a more fundamental measurement of transudation time could be obtained by covering the test specimen with a flat glass plate, (see note). The elimination of evaporation through the top surface of the specimen appreciably reduced the measured values of size time, and it seems clear that the observed reduction is due to a real increase in actual penetration rate. Alternate measurements made with, and without, a cover glass on specimens of the same sample resulted in an average t_1 of 59.5 seconds and an average t_{1g} of 51.3 seconds. The visual F.S.T. size time obtained for this sample, at about the same time, was 56.6 seconds, which lies between the t_1 and t_{1g} values.

If the uranine B indicator were subject to the water vapor error, such error would be most pronounced when specimens are covered. Consequently, careful observations relating to the influence of water vapor were made. In a special test, a specimen having a transudation time of about one minute was placed immediately over a water surface. A waterproofed fourdrinier wire was used to separate the paper and the water, and to ensure close spacing between the two surfaces. A time of 30 minutes was required before an appreciable intensity of fluorescence developed; this intensity was of the order of 20 to 30 per cent of the intensity which obtains in a normal test. This result means that a weak end-point will eventually be brought about by water vapor alone, when conditions are such that the water vapor pressure may rise to a high value, and the cellulose fibers and dye particles may adsorb water until the dye concentration falls below the critical value. This result is perhaps to be expected, for it is known that the moisture content of paper exposed to a saturated atmosphere will eventually rise to a relatively high value. In view of the fact that appreciable fluorescence did not develop until a time of the order of thirty times the transudation time had elapsed, it would seem highly improbable that t_{1g} is subject to appreciable water vapor error. In a further and equally convincing test, the size time *vs.* basis weight relationship was investigated for a set of samples in five basis weights. On the same day, both visual F.S.T. size times, as previously obtained, and t_{1g} values were obtained. The value of the exponent m previously discussed was 1.75 for the visual F.S.T. and 1.78 for the size times obtained with a flat cover glass; the value of m which had been obtained two years previously with the visual F.S.T. on the same

Note: A thin glass plate does not appreciably reduce the intensity of the near ultraviolet light incident on the specimen.

set of papers was 1.80. In a more recent test of the size time *vs.* basis weight relationship, using a different set of papers (in eight basis weights) and a photoelectric end-point detector, the m value obtained from t_{1g} values was 2.02; the m value which had been obtained two years previously with the visual F.S.T. was 1.72. It was then concluded that any water vapor error in t_{1g} was negligible.

Reproducibility

The accuracy, with which measurements of size time could be reproduced, was considerably improved when the cover glass was used. This improvement is attributed to the elimination of the effect of accidental air currents above an uncovered specimen. In a test of reproducibility with the photometric equipment, test specimens were cut from six 8½ x 11-in. sheets. These specimens were divided into two series. The results are given in Table V. Each value given is the average of five or six determinations. It is apparent from inspection of the data that the large variation which occurred on February 9, 1938, was a sample variation. In general, the variations are adequately small, and it is probable that the major part of them is to be attributed to nonuniformity of the paper.

TABLE V.—DATA SHOWING THE VARIATION OF t_{1g} FROM DAY TO DAY

First series		Second series	
Date	t_{1g}	Date	t_{1g}
1/31/38	50.3 sec.	2/10/38	*52.6 sec.
2/ 1/38	52.5	2/10/38	*53.6
2/ 1/38	51.0	2/10/38	*51.0
2/ 9/38	58.1	2/10/38	50.6
2/10/38	51.5	2/11/38	53.4
2/11/38	49.7	2/12/38	54.5

* Three values obtained in succession.

Development of the Photoelectric Fluorescence Recorder

The addition of a cover glass had the fortunate outcome that the intensity of fluorescence at the end-point was considerably greater than that which previously obtained, especially in the case of hard sized samples. This was due partly to the fact that larger quantities of dye could be applied (up to about 100 micrograms per square centimeter, or about 1 milligram over the usual treated area). It, then, became feasible to measure the fluorescent intensity by photoelectric means. A schematic diagram of the laboratory apparatus which was devised is shown in Fig. 6. Light from a small mercury arc of high surface brightness, L, was condensed by a quartz lens Q and filtered by an ultraviolet filter F_1. Part of the

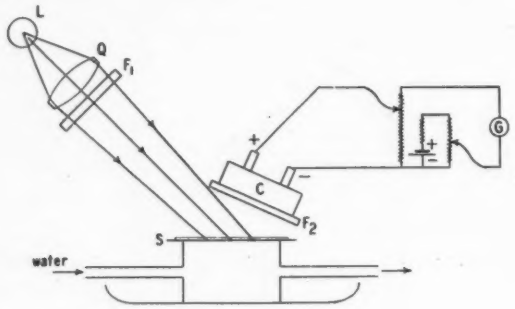


FIG. 6.
Schematic diagram of laboratory arrangement for photoelectric measurement of intensity of fluorescence.

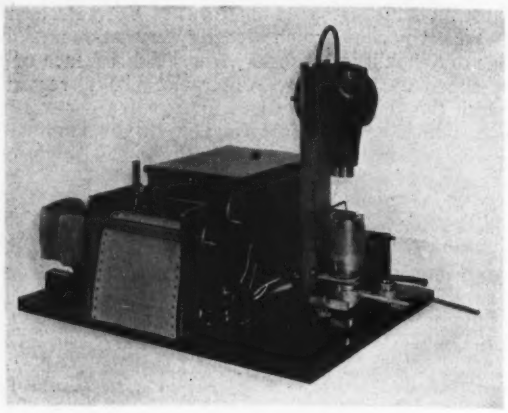


FIG. 7.
The fluorescence recorder for the objective measurement of size time.

fluorescent light originating in the specimen S fell upon the photocell assembly, which consisted of a very sensitive photocell C, of the blocking-layer type, placed behind a filter F_2 which completely eliminated ultra-violet light and the violet end of the visible spectrum. The photocell was connected through a control circuit to a sensitive galvanometer G. The control circuit enabled the operator to balance out the photocurrent due to background fluorescence, and to adjust the sensitivity so that the full-scale deflection of the galvanometer would correspond roughly to the final equilibrium value of the photocurrent. Curves of the sort illustrated in Fig. 5 were obtained.

A considerable amount of work with the laboratory model led to the final design of the photoelectric fluorescence recorder. A photograph of the first model of the fluorescence recorder is reproduced in Fig. 7. The outstanding feature of this instrument is its almost complete freedom from personal error. After applying the dye to a specimen, the operator places the specimen in a sample holder and covers it with a flat cover glass. He then presses a lever, and the water cup rises automatically to bring the free water surface in contact with the specimen; the upward rise of the water cup is damped with a small dash pot. When the water surface meets the specimen, the synchronous motor which drives the chart paper starts automatically. All that the operator must do is to turn the hand wheel to follow the galvanometer deflection. This can be done by an inexperienced person with very good accuracy. This manual feature of the recording holds the cost of construction of the instrument down to several hundred dollars less than the cost of a similar instrument with completely automatic recording. The instrument has the important advantages of a recording device: time is saved, a permanent record is had, and "mistakes" like misreading of a stop watch, galvanometer deflection, etc., are eliminated. When runs on a series of specimens have been completed, the operator obtains the t_{1g} values from the recordings as previously described. It is not actually necessary for him to construct straight lines with a pencil, for the readings can be made quickly with only the aid of a celluloid straight-edge. A reproduction of a typical chart is given in Fig. 8.

Provision was made in the design of the fluorescence recorder for gentle flushing of the water cup

with fresh water of proper temperature. When the operator releases the water cup assembly, this flushing proceeds automatically and continues throughout the test; it is automatically stopped when the cup assembly is again lowered. A small thermometer, enabling the operator to obtain precise readings of the temperature of the water immediately below the specimen, is sealed into the cup. The cup assembly is provided with a small accessory cup, which serves to hold the head of water under the specimen at 1/16 in.; this, also, serves to make the free water surface in the cup stand above the cup's rim prior to contact with the specimen. The large and small cups are surrounded by small catch basins or moats, so that overflow water is properly disposed of.

Using both photoelectric devices, a number of variables were studied. These studies are presented in the following sections. The data of Table VI are given to acquaint the reader with the order of magnitude of photoelectrically determined size times.

Variables Associated with the Dye

A seemingly vulnerable point of the method which has been described, is the variable application of dye by the brushing technique. Indeed, if the end-point were subject to appreciable water vapor error, it would be expected that t_{1g} values would be appreciably influenced by variations in dye weight. However, no quantitative means is normally employed to ensure a constant weight of dye applied, and, in spite of this, very good reproducibility is obtained. The operator merely brushes on an amount sufficient to produce a faint red coloration. This point was carefully investigated, however, in tests where the weight of dye was consciously varied through wide limits. The weight of dye applied to each specimen was evaluated by spectrophotometric means. The results are presented in Table VII. In view of the extremes which were employed in the application of the dye, the agreements indicated in Table VII show that, in normal application, the error due to variations in dye

TABLE VI.—COMPARISON OF PHOTOELECTRICALLY DETERMINED SIZE TIMES (t_{1g}) AND VISUAL F. S. T. AND TAPPI SIZE TIMES

Sample no.	Class	Basis weight	t_{1g} (sec.) (1938)	Visual F. S. T. (sec.) (1936)	TAPPI (sec.) (1936)
83904	butchers wrap	28	54	56	42
83905	bctchers wrap	37	94	99	63
83906	offset	60	92	111	61
83912	striped sulphite wrapper	30	37	40	32
83913	striped sulphite wrapper	34	39	46	43
83914	striped sulphite wrapper	35	43	53	38
83921	kraft bag A	30	62	69	32
83929	kraft bag B	25	27	46	22
83930	kraft bag B	30	57	71	35
83931	kraft bag B	40	75	110	47
83932	kraft bag B	50	111	140	60
83933	kraft bag B	60	165	210	74
83934	kraft bag B	65	176	259	87
83935	kraft bag B	70	164	309	102
83936	kraft bag B	75	282	321	99
83941	English finish book	50	26	19	24
83943	coating raw stock	43	64	59	42
83947	coating raw stock	50	90	59	50
83948	coating raw stock	68	87	88	52
83949	coating raw stock	114	209	208	111
83951	folding coating	88	119	110	76

weight is quite negligible. Moreover, the differences are reversed in the results for the two samples which are most hard sized and show the largest differences. The errors indicated in this and succeeding tabulations are probable erors in the means.

TABLE VII.—EFFECT OF EXTREME VARIATION IN DYE WEIGHT

Sample no.	t_{1g} (sec.) (heavy brushing)	Av. wt. of dye (micrograms)	t_{1g} (sec.) (light brushing)	Av. wt. of dye (micrograms)
83895	48.6±1.5	1113	48.6±1.1	140
83904	29.8±1.5	1035	35.2±0.2	232
83907	104.0±6.0	729	120.0±2.9	125
83937	13.8±0.2	328	15.4±0.5	40
83940	8.5±0.5	347	7.8±0.3	120
83948	76.0±1.6	915	63.0±0.5	166

The data of Table VIII indicate that particle size of the dye has but little influence, for widely different particle size distributions were employed. The "fine" dye was passed by a 200-mesh screen, and the "coarse" was rejected by this screen; the latter contained, in addition to larger particles, small clumps or agglomerates of smaller particles. The coarse dye had to be "scrubbed" onto the test specimens, and the consequent abrading action may have had some

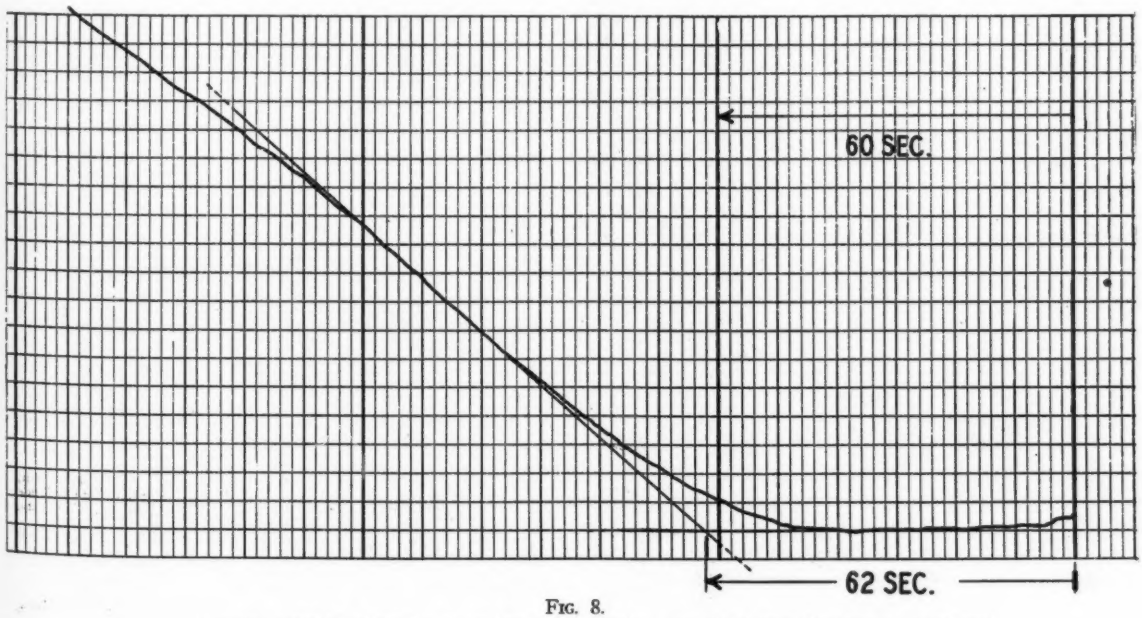


FIG. 8.
A typical recording obtained with the fluorescene recorder. The dotted lines show how t_{1g} is obtained.

influence on the observed size times. The data indicate that particle size has little effect, if any, where the dye is kept dry and in a fine state. Two of the three largest differences are reversed.

TABLE VIII.—EFFECT OF PARTICLE SIZE OF THE DYE

Sample no.	t_{1g} (sec.) fine dye	t_{1g} (sec.) coarse dye
83895	53.0±1.0	52.6±0.8
83904	34.8±1.5	32.6±0.5
83907	119.0±3.4	107.0±4.0
83933	112.0±1.3	101.0±2 5
83937	16.2±0.3	15.0±0.3
83940	8.4±0.3	8.6±0.7
83948	69.8±1.2	74.5±1.5

While it is strongly preferable, and almost imperative to keep an open supply, in a humid room, dry by warming, it was thought of interest to investigate the influence of moisture content of the dye. Accordingly, a series of tests were made in which one supply of dye was kept in a dry, fine state of warming, and another supply was permitted to stand for a long period of time in contact with air of 54 per cent relative humidity and temperature of 25.5 deg. C. The dry dye was maintained at a temperature of 46 deg. C. (higher than necessary) by means of a lamp. The other portion of dye had a moisture content of 1.42 per cent. The data of Table IX show that no error can be attributed to variable moisture content of the dye in normal tests.

TABLE IX.—EFFECT OF MOISTURE CONTENT OF THE DYE

Sample no.	t_{1g} (sec.) dry dye	t_{1g} (sec.) moist dye
83895	53.0±1.0	51.3±0.7
83904	34.8±1.5	35.9±0.7
83907	119.0±3.4	118.9±3.8
83908	168.5±1.9	160.0±2.9
83933	112.0±1.3	110.0±3.2
83937	16.2±0.3	17.7±0.3
83940	8.4±0.3	8.4±0.3
83948	69.8±1.2	83.0±0.3
83949	195.9±2.6	195.6±2.6
blueprint stock	59.8±0.7	63.6±0.8
bond	61.0±0.6	60.7±0.7
ledger	178.5±1.1	164.3±1.8

Effect of Temperature of the Water

In any penetration process, the time for transudation depends upon the temperature of the penetrant, because the viscosity and surface tension of liquids vary markedly with temperature. Accordingly, careful tests were performed to ascertain typical temperature correction data. The results obtained are presented in Table X. An attempt was made to compare the ratios of size times at different temperatures with the corresponding ratios of the ratio of viscosity of water to surface tension. Little agreement was obtained, however, it being found in all cases, except one, that the former ratio was substantially larger. A correct comparison must necessarily involve change in contact angle with temperature. It is believed that the contact angle decreases with increasing temperature and that this dependence of contact angle on temperature would account for the differences. It will be seen from the table that a fairly typical figure for the temperature effect is −5 per cent change in t_{1g} per deg. C. The significance of this is that, in accurate work, the temperature must be held constant to within a fraction of 1 deg. C.

TABLE X.—TEMPERATURE EFFECT

Sample no.	Temp. deg. C.	t_{1g} (sec.)	Temp. deg. C.	t_{1g} (sec.)	Temp. deg. C.	t_{1g} (sec.)	Change per deg. C. at room temp. per cent
114T	24.0	57.1±0.6	27.5	50.4±0.3	31.0	39.6±0.2	—4
Ledger	24.2	165.0±1.8	28.0	123.6±1.2	31.0	111.7±1.8	—7
Bond	24.2	65.4±1.2	28.0	49.7±0.2	31.0	43.3±0.2	—7
83898	24.0	85.8±0.6	28.0	72.5±0.6	...	.....	—4
83903	27.5	112.6±1.2	27.3	106.2±1.8	31.0	89.4±1.8	—6
83904	26.5	35.6±0.6	28.0	34.4±0.6	29.5	32.5±0.5	—2
83906	24.0	99.0±2.0	28.0	81.6±1.5	35.0	61.8±1.0	—5

TABLE XI.—INFLUENCE OF RELATIVE HUMIDITY OF CONDITIONING ATMOSPHERE

Sample no.	t_{1g} (sec.)	R. H. per cent	t_{1g} (sec.)	R. H. per cent	Change per point R. H. per cent
83897	60.0±0.7	54	65.5±1.3	38	—0.80
83898	89.5±1.1	54	90.1±1.2	31	—0.14
83905	98.0±1.8	50	102.2±1.1	31	—0.22
83906	104.4±1.7	50	120.7±1.2	38	—1.13
83907	124.4±1.6	54	133.4±1.4	31	—0.23
83908	161.0±3.4	53	145.9±4.1	29	+0.14
83911	121.4±2.9	53	147.3±1.9	33	—0.66
83937	28.3±0.2	48	32.4±0.6	38	—0.74
83938	43.1±0.4	48	47.0±0.5	38	—0.46
83942	30.5±1.4	48	33.6±1.1	38	—0.72
83944	38.6±0.5	48	38.6±0.6	38	+0.12
83947	64.2±1.1	48	69.1±0.7	31	—0.27
83949	203.8±5.6	53	234.0±2.4	29	—0.46
ledger	193.0±2.1	48	194.5±1.6	29	—0.25
blueprint	67.5±0.5	48	65.7±0.6	38	+0.14
bond	63.0±1.1	..	69.4±0.4	38	—0.69
				Average	—0.39

Effect of Relative Humidity of Conditioning Atmosphere

A series of tests were carried out to ascertain typical differences in size times caused by changing the relative humidity from a low value (30 to 38 per cent) to a higher value (48 to 54 per cent). The data obtained are presented in Table XI. A small temperature correction was applied in the computation of per cent difference per point change in relative humidity. A plus sign means that the size time increases with increasing relative humidity. It will be seen that the differences covered a range from about −1 per cent per point r. h. to +0.14, the average being −0.4 per cent per point r. h. In consideration of normal variations in temperature and relative humidity, it is seen that temperature variations would influence test data more seriously than variations in relative humidity.

Reproducibility of the Photoelectric Method for the Determination of Size Times

The reader may obtain a reliable estimate of the reproducibility of the photoelectric method by study of the data presented in Tables VII to XI, inclusive. The errors given in these tabulations are *probable errors in the means.* Each mean is from ten observations. In a study of the distribution of probable errors in 100 means, it was found that the error distribution curve approximated the Gaussian distribution, with an average probable error of 1.5 per cent. By computation, the probable error in an individual determination is 4.7 per cent. It is apparent that these errors include the effects of sample variations as well as variations due to the testing method itself.

Acknowledgments

It is a pleasure to acknowledge Willmer Wink of the Institute staff for his careful observations during the early phases of the work and Carleton Root, also of the Institute staff, for his care in constructing the photoelectric recorder.

Literature Cited

(1) Carson, F. T. U. S. *Natl. Bur. Standards Technologic Paper* no. 326 (Sept., 1926). This paper contains many references of interest. For further references, see *(2)*.
(2) TAPPI Standard Method T433 m-36. This contains references of interest.
(3) Anon., *Paper Trade J.* 97, no. 3:20 (July 20, 1933); Broadbent, F. D., Brown, C., and Harrison, H. A., *World's Paper Trade Rev.*, VJE, no. 23:1851-2, 1854, 1892, 1894 (June 5, 1936); no. 24:1932, 1934, 1972, 1974 (June 12, 1936).
(4) Cobb, R. M., and Lowe, Donald V., *Paper Trade J.* 98, no. 12:43-46 (March 22, 1934).
(5) Grant, J., *World's Paper Trade Rev.*, 103, no. 20:1548, 1550, 1588, 1590, 1592 (May 17, 1935).
(6) Unpublished work.
(7) Cameron, F. K., and Bell, J. M., *Bull.* no. 30, Bureau of Soils, U. S. Dept. of Agriculture (1905).
(8) Lucas, Richard, *Kolloid Z.* 23, 15-22 (1918).

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 18, 1939

SUMMARY

Wall board .....2,782 bdls.
Insulation board .....275 crates, 2 cs.
Newsprint .....1,837 rolls
Printing paper .....68 cs., 107 rolls
Wrapping paper .....109 rolls
Drawing paper .....48 rolls, 23 cs., 1 crate
Filter paper .....101 bls., 1 cs.
Marble paper .....1 bl.
Surface coated paper .....285 cs.
Basic paper .....103 cs.
Photo paper .....1 cs.
Decalcomanias .....39 cs.
Stencil paper .....4 cs.
Receipt paper .....399 rolls
Transparent paper .....10 cs.
Miscellaneous paper .....451 bls., 3,405 rolls

WALL BOARD

Treetex Corp., *Stegholm,* Gothenburg, 2,782 bdls.

INSULATION BOARD

A. H. Morner, *Stegholm,* Gothenburg, 275 crates, 2 cs.

NEWSPRINT

Perkins Goodwin & Co., *Stegholm,* Gothenburg, 304 rolls.
Parsons & Whittemore, Inc., *Stegholm,* Gothenburg, 218 rolls.
Nolan Bowmall & Co., Inc., *Stegholm,* Gothenburg, 148 rolls.
H. G. Craig Co., Inc., *A.C.D.,* Donnacona, 452 rolls.
International Paper Co., *International #1,* Gatineau, 409 rolls.
H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 306 rolls.

PRINTING PAPER

General Motors Overseas Operations, *Noordam,* Rotterdam, 68 cs., 107 rolls.

WRAPPING PAPER

——, *Scanyork,* Gothenburg, 109 rolls.

DRAWING PAPER

Rohner Gehrig & Co., *Noordam,* Rotterdam, 48 rolls, 23 cs., 1 crate.

FILTER PAPER

General Motors Overseas Operations, *Noordam,* Rotterdam, 100 bls.
——, ——, Bordeaux, 1 cs., 1 bl.

MARBLE PAPER

Japan Paper Co., *Pennland,* Antwerp, 1 bl.

SURFACE COATED PAPER

Gevaert Co. of America, *Pennland,* Antwerp, 78 cs.
General Motors Overseas Operations, *Noordam,* Rotterdam, 207 cs.

BASIC PAPER

Dingelstedt & Co., *Pennland,* Antwerp, 8 cs.
General Motors Overseas Operations, *Noordam,* Rotterdam, 95 cs.

PHOTO PAPER

Roepke & Otto, *Noordam,* Rotterdam, 1 cs.

DECALCOMANIAS

General Motors Overseas Operations, *Noordam,* Rotterdam, 37 cs.
Roepke & Otto, *Noordam,* Rotterdam, 1 cs.
Chase National Bank, *Noordam,* Rotterdam, 1 cs.

STENCIL PAPER

——, *Mormacport,* Copenhagen, 4 cs.

RECEIPT PAPER

National Cash Register Co., *Mormacport,* Copenhagen, 399 rolls.

TRANSPARENT PAPER

H. Kempner, *Noordam,* Rotterdam, 10 cs.

MISCELLANEOUS PAPER

Gilman Paper Co., *Stegholm,* Gothenburg, 736 rolls.
Clinton Paper Co., *Stegholm,* Gothenburg, 703 rolls.
The Borregaard Co., Inc., *Stegholm,* Gothenburg, 16 rolls.
F. L. Kramer & Co., *Stegholm,* Gothenburg, 144 bls.
Metropolitan Paper & Bag Co., *Stegholm,* Gothenburg, 1,092 rolls, 32 bls.
Blauvelt Wiley Paper Manfg. Co., *Stegholm,* Gothenburg, 24 rolls.
Lincoln Import Specialties Corp., *Stegholm,* Gothenburg, 834 rolls, 275 bls.

RAGS, BAGGINGS, ETC.

Castle & Overton, Inc., *Uruguay,* Buenos Aires, 303 bls. bagging, 70 bls. rags.
Burka Bagging Co., *Fort Townshend,* Halifax, 132 bls. bagging.
Castle & Overton, Inc., *Mormachawk,* Buenos Aires, 23 bls. rags, 60 bls. bagging, 100 bls. paperstock, 20 bls. cuttings.
Loumar Textile By-Products, *Burma,* Venice, 82 bls. rags.
Continental Bank Trust Co., *Burma,* Trieste, 54 bls. rags.
American Express Co., *Noordam,* Rotterdam, 264 bls. rags.

OLD ROPE

W. Steck & Co., *Scanyork,* Copenhagen, 782 coils.
——, *Jamaica,* Cristobal, 3 bls.

CASEIN

A. Hurst & Co., *Uruguay,* Buenos Aires, 2,703 bags, 162,180 kilos.
American British Chemical Supplies, *Uruguay,* Buenos Aires, 3,887 bags, 270,120 kilos.
Tupman Thurlow Co., *Uruguay,* Buenos Aires, 1,668 bags, 100,080 kilos.
T. M. Duche & Son, *Uruguay,* Buenos Aires, 2,668 bags, 150,000 kilos.
Packing Products Corp., *Uruguay,* Buenos Aires, 250 bags, 15,000 kilos.
American Cyanamid & Chemical Co., *Mormachawk,* Buenos Aires, 2,084 bags, 125,040 kilos.
Chemical Bank Trust Co., *Olaf Bergh,* Buenos Aires, 167 bags.

WOOD PULP

Diamond Mills Paper Co., *Stegholm,* Gothenburg, 300 bls. wood pulp.
M. Sone, *Stegholm,* Gothenburg, 550 bls. wood pulp.
Park Tissue Mills, *Stegholm,* Gothenburg, 300 bls. wood pulp.
D. M. Hicks, Inc., *Stegholm,* Gothenburg, 300 bls. wood pulp, 450 bls. dry sulphite.
J. Anderson & Co., *Stegholm,* Gothenburg, 4,200 bls. wood pulp, 875 bls. bleached sulphite.

WOOD PULP BOARDS

Salwen Paper Co., *Stegholm,* Gothenburg, 152 bls.
Standard Fiber Specialties, *Stegholm,* Gothenburg, 20 bls.
Beaverite Products Co., *Stegholm,* Gothenburg, 247 bls.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 18, 1939

Pagel Horton & Co., Inc., *Tauri,* Husum, 4,200 bls. dry sulphate.
Price & Pierce, Ltd., *Tauri,* Kopmanholmen, 5,100 bls. un-

bleached sulphate, 1,200 bls. bleached sulphate, 150 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Tauri,* Sikea, 13,710 bls. unbleached sulphite.
Pulp Sales Corp., *Tauri,* Rauma, 4,265 bls. bleached sulphite, 510 bls. strong sulphite.
Pulp Sales Corp., *Tauri,* Varjakka, 6,245 bls. strong sulphate, 600 bls. strong sulphite.
Pagel Horton & Co., Inc., *Belos,* Gefle, 16,600 bls. dry sulphite, 2,375 bls. dry sulphate.
Pagel Horton & Co., Inc., *Consul Corfitzon,* Sweden, 1,075 lbs. wood pulp.
M. Sone, *Vidar,* Ornskoldsvik, 12,010 bls. wood pulp.

NEW LONDON IMPORTS

WEEK ENDING NOVEMBER 18, 1939

Pagel Horton & Co., Inc., *Consul Corfitzon,* Sweden, 625 bls. wood pulp.

NEWARK IMPORTS

WEEK ENDING NOVEMBER 18, 1939

H. G. Craig Co., Inc., *G.T.D.,* Donnacona, 328 rolls newsprint.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 18, 1939

Gottesman & Co., Inc., *Mormacport,* ——, 1,200 bls. sulphite.
Castle & Overton, Inc., *Mormachawk,* Buenos Aires, 400 bls. paper stock.
A. Hurst & Co., *Mormachawk,* Buenos Aires, 767 bags casein, 40,020 kilos.
Pagel Horton & Co., Inc., *Tana,* Norway, 1,293 rolls newsprint.
Price & Pierce, Ltd., *Tana,* ——, 625 bls. bleached sulphite.
M. Sone, *Signeborg,* Sundsvall, 3,000 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 18, 1939

Pagel Horton & Co., Inc., *Atland,* Sweden, 28,377 bls. wood pulp.
Price & Pierce, Ltd., *Atland,* ——, 4,800 bls. unbleached sulphate, 1200 bls. bleached sulphate.
Price & Pierce, Ltd., *Flora,* ——, 2,700 bls. unbleached sulphate, 2,100 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Flora,* Sweden, 6,000 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 18, 1939

Price & Pierce, Ltd., *Etna,* ——, 4,200 bls. unbleached sulphite.

LOS ANGELES IMPORTS

WEEK ENDING NOVEMBER 18, 1939

——, *Asama Maru,* Japan, 2 cs. writing paper, 1 cs. stencil paper.
——, *Tosan Maru,* Japan, 2 cs. paper.
——, *Josephine Lawrence,* Ocean Falls, 2,092 rolls newsprint.

T. W. Estabrook Returns to Brown Co.

Henry P. Carruth, general manager of the Brown Company announces that Thomas W. Estabrook has returned to the Brown Company as manager of purchasing. Mr. Estabrook was formerly purchasing agent for a number of years for the Brown Company and has returned to this firm from the Eastern Corporation at South Brewer, Me., where he was assistant to the general manager. Mr. Estabrook will make his headquarters at Berlin, N. H.

Fishman Paper Co. Opens Warehouse

On Saturday, November 18, the H. Fishman Paper Company, paper products of every description, opened its new office and warehouse at 2551 Jerome avenue, New York. Many customers and friends of the company were present and congratulated the firm on its success and expansion.

Curt R. Burkhardt Dead

Curt R. Burkhardt, president of the American-Canadian Machinery Exchange, 39 Cortland street, New York, dealers in used paper and pulp mill machinery, specializing in Canadian trade, died suddenly of a heart attack at his home at 384 Morningside Terrace, Teaneck, N. J. He was born in Germany sixty years ago and learned the paper business there. Later he served in the German Navy for a number of years and gained wide experience in his travels all over the world.

In 1900 during the Boxer Rebellion in China, when the armed forces of Great Britain, France, Germany and the United States were facing the Boxers before the gates of Peking, the commanding officers called for four volunteers from each contingent to rush the gates and plant explosives to blow up the gates to gain entry within the walls of the city. Mr. Burkhardt was one of the sixteen volunteers and though seriously wounded, he was one of the four who survived. For his meritorious actions he was awarded the Iron Cross by former Kaiser Wilhelm II of Germany.

Mr. Burkhardt came to this country with his family about thirty years ago and became an American citizen. At one time he was vice-president and general manager of the former National Asbestos Manufacturing Company of Jersey City, N. J. In the late 20's he owned and operated the Burkhardt Paper Company, formerly the American Asbestos Covering Company at Niagara Falls, N. Y. He lost this mill during the early part of the depression in 1930. In 1931 he equipped and owned another paperboard mill at Carlstadt, N. J., known as the Burkhardt Paper Mills, Inc. This mill was completely destroyed by fire in 1933 and he then formed the American-Canadian Machinery Exchange. During the past five or six years he has worked very closely with the Gibbs-Brower Company, Inc., of No. 21 East 40th street, New York City, in the capacity of pulp and paper mill engineer and practical advisor. His loss is felt keenly by them, and his many friends in the industry.

Surviving are his wife and daughter.

Dee & Anderson Get New Accounts

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 20, 1939.—Dee & Anderson, Inc., 10 High street, were recently appointed New England selling representatives for the Harvey Paper Products Company, of Sturgis, Mich., a leader in the specialty paper field, and for the Forster Manufacturing Company, who make a complete line of wood products. Both of these companies have been serving the paper jobbing trade a great many years.

Boston Business Definitely Better

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 20, 1939.—Business is definitely better, with orders being placed freely at present prices, it is stated in the paper trade here. The buying orgy which prevailed for a few months has abated, but business is progressing better than usual for the time of year. The trade is definitely sold on the idea that prices are not out of line with general conditions.

LATEST MARKET REVIEW

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 22, 1939.

Business throughout the country continues at so high a level that some business leaders and economists believe that the volume of industry and trade will continue to rise and surpass the record established in 1929. Reports from many leading manufacturers' representatives, jobbers, and general paper merchants, indicate that sales volume is being well maintained in practically all grades of paper and paper board.

The high level of industry and trade today is indicated in the index of general business activity which rose to 107.2 per cent for the week ended November 11, from 105.3 per cent for the preceding week, compared with 90.3 per cent for the corresponding week last year.

Paper production as reported by 192 mills was estimated at 98.4 per cent for the week ended November 11, as compared with 80.9 per cent for the corresponding period in 1938, and with 61.0 per cent in 1937. Paper board production for the week ended November 11 was 84.0 per cent, compared with 68.0 per cent for the like period in 1938, and with 57.0 per cent in 1937.

Consumption of newsprint continues to gain slowly. Shipments from domestic mills for the month of October was reported at 79,364 tons, while 289,260 tons were shipped from Canadian mills. Total domestic production for the ten months of this year was 116,910 tons, which was seventeen and six tenths per cent higher than in the first ten months of 1938. A dual price situation in newsprint is indicated by a domestic producer announcing a price of $49, while Canadian producers announcing a price of $50 per ton for the first quarter of next year.

The Great Northern Paper Company announced last week that its New York price on newsprint will be $49 per ton for the first quarter of 1940, and $50 per ton for the second quarter of 1940.

Mill reports indicate that, while current production in some grades of paper is running higher than consumption, and backlog orders are being reduced, output is well balanced with shipments.

The demand for most grades of sulphite papers continues heavy and this applies also to most grades of tissue papers, and many grades of groundwood papers. Large sales volume is reported on most grades of paper products and specialties.

Kraft paper production continues practically at mill capacity, with orders running at a high level, thus striking a satisfactory balance between production and shipments.

Paper board production continues at a high level, with orders for many grades of board running ahead of production. The demand for kraft liner board continues heavy and all mills are reported booked to capacity, with ample opportunity to add backlog orders if producers so desired. Prices on all grades of paper, including representative quoted resale prices, continue unchanged.

Mechanical Pulp

No important change in demand or prices of mechanical pulp has been reported during the current week.

Chemical Pulp

Demand continues heavy and shipments of pulp from the northern countries are reported to be coming in as well as can be expected, though some manufacturers' representatives report some complaint by mills occasioned by delay due to hostilities overseas. No change in prices has been reported this week.

Old Rope and Bagging

Despite a little firmer tone in prices on some grades, trading in old rope continues at about the same level of activity as that of last week. Foreign No. 1 Manila rope is a little higher this week and currently quoted at from $3.90 to $4.15. No change in domestic Manila has been reported to date, the prevailing quotations being $3.75 to $4.00.

With roofing mills showing little interest in the market this week, trading in old bagging is reported as rather quiet. Prices are unchanged.

Rags

Trading in all grades of new and old domestic rags is reported as rather quiet this week. No change in prices on any grade has been reported. Prices on foreign rags are nominal.

Old Waste Paper

The old waste paper market was a little more active last week by shipments of a fair-sized tonnage of mixed papers to Canadian mills. Prices continue unchanged and the market is reported in some quarters of the trade as a little softer at this date.

Twine

The twine market continues quite firm under a good demand for many grades of hard and soft fiber twines. No important change in prices has been reported during the current week.

Consolidated to Give Bonus

The Consolidated Paper Company, Monroe, Mich., has authorized a bonus for all employes at the mill with a service record of three months or longer. It will be payable on December 18, with individual distribution ranging from $30.00 to $7.50 for those of short-term records.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 22, 1939.

BLANC FIXE—Prices on blanc fixe continue firm and unchanged under a steady demand. The pulp is currently quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Quotations on bleaching powder are firm under a steady demand, with prices unchanged at prevailing market quotations. Bleaching powder is currently quoted at from $2 to $2.85 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues to be reported as good. Standard domestic casein, 20-30 mesh, is currently quoted at from 19 to 20 cents per pounds; 80-100 mesh, at 20½ cents per pound; all prices in bags, car lots. Argentine casein, 20-30 mesh, is quoted at 15 cents per pound. Quotations on French casein at from 14 to 14½ cents per pound are nominal.

CAUSTIC SODA—Prices on caustic soda are firm under an active demand. Solid caustic soda is currently quoted at from $2.30 to $2.40 per 100 pounds; flake and ground at from $2.70 to $2.95 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay continue firm under a good demand. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13.50 to $25 per ton, ship side.

CHLORINE—Prices on chlorine continue firm under a good demand at prevailing market quotations. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week, with lower prices on some grades. "G" gum rosin is currently quoted at $5.15 per 280 pounds, gross weight, in barrels, at Savannah. "FF" wood rosin is offered at $5.10 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.80 per 100 pounds, f.o.b. shipping points.

SALT CAKE—Quotations on salt cake in view of the heavy demand are practically nominal on spot business. Current quotations range at from $15 to $19 per ton; chrome salt cake at from $15 to $16 per ton, f.o.b., shipping point. Quotations on imported salt cake are nominal.

SODA ASH—Prices on soda ash are firm under a good demand, with quotations unchanged at prevailing market levels. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.10; and in barrels, $1.35.

STARCH—Quotations on corn starch are firm and unchanged under a steady demand. Globe pearl is currently quoted at $2.45 per 100 pounds; special paper starch at $2.55 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices on sulphate of alumina are firm under a steady demand. The commercial grades are currently quoted at $1.15; iron free at $1.45 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Quotations on sulphur are firm under a good demand and unchanged at prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Prices on talc continue firm under a good demand and are unchanged at prevailing market levels. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Quotations on imported talc are nominal.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$4.87½	@	$5.50
Superstandard	4.50	"	5.00
Northern Standard Wrapping	4.25	"	4.50
Standard Wrapping	4.00	"	—
Tissues—Per Ream—Carlots			
White No. 1	.87½	@	—
White No. 1 M. G.	.85	"	—
White No. 1½	.70	"	—
White No. 2	.65	"	—
Anti-Tarnish M. G.	.75	"	—
Colored	.80	"	—
Kraft	.75	"	—
Manila	.65	"	—
Unbl. Toilet, 1 M.	3.35	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	1.85	@	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	45.00	@	—
Chip	45.00	"	—
Sgl. Mla. Ll. Chip	57.50	"	—
Jute Lined Chip	57.50	"	—
White Pat. Coated	70.00	"	—
Kraft Liners	55.00	"	—
Binders Boards	76.00	"	87.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers		
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25	
100% Rag	31.05	" 36.50	32.20	"	37.75
85% Rag	....	"	29.90	"	35.00
75% Rag	23.60	" 27.75	24.75	"	29.00
65% Rag	....	"	21.65	"	26.25
50% Rag	17.55	" 21.50	18.70	"	22.75
25% Rag	14.65	" 17.75	15.80	"	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers		
No. 1	$8.95	@ $11.00	$10.10	@	$12.25
No. 2	8.05	" 9.75	9.25	"	11.25
No. 3	7.60	" 9.25	8.50	"	10.75
No. 4	7.30	" 9.00	8.50	"	10.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	8.35	"	9.50
No. 2 Offset	7.70	"	9.00
A Grade E. F.	7.50	"	8.75
A Grade S. & S. C.	7.75	"	9.00
B Grade E. F.	6.95	"	8.00
B Grade S. & S. C.	7.20	"	8.25
C Grade E. F.	6.65	"	7.75
C Grade S. & S. C.	6.90	"	8.00
D Grade E. F.	6.40	"	7.50
D Grade S. & S. C.	6.65	"	7.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	30.00	@	35.00
Dry	30.00	"	35.00
(Delivered)			
No. 1 Domestic and Canadian	38.00	@	40.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.50	@	3.00
Prime Qualities—			
Easy-Bleaching Sulphite	2.20	"	2.35
Strong Unbleached Sulphite	2.10	"	2.30
(On Dock, Atlantic Ports)			
Kraft Bleached	2.75	@	3.25
Kraft Light & Strong	1.65	"	1.80
Kraft No. 1	1.60	"	1.75
(F. o. b. Pulp Mill)			
Kraft Domestic	1.60	"	2.12½
(Delivered)			
Soda Bleached	2.55	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits. Also add extra freight charges and war insurance to all quotations on imported pulp.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	8.00	@	8.25
Silesias No. 1	5.25	"	5.50
New Unbleached	8.00	"	8.25
Blue Overall	5.50	"	5.75
Fancy	2.50	"	3.00
Washables	2.15	"	2.25
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.00	"	3.25

Old Rags

White, No. 1—			
Repacked	3.50	"	4.00
Miscellaneous	3.00	"	3.25
White, No. 2—			
Repacked	1.25	"	2.75
Miscellaneous	1.75	"	1.90
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	1.70	"	1.80
No. 2	1.35	"	1.40
No. 3 (bagging)	1.50	"	1.60
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

PULP

BLEACHED SULPHITE
'Stormont' Grade

BLEACHED SODA
'Seagull' Grade

GROUNDWOOD
'Crabtree' Grade

BLEACHED KRAFT
'Tuftare Fibre' Grade

made by

HOWARD SMITH PAPER MILLS LIMITED
407 McGill St., Montreal, Canada

Sulphite & Soda Mill: Cornwall, Ont. *Groundwood Mill:* Crabtree Mills, P.Q. *Kraft Mill:* Windsor Mills, P.Q.

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 75 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

Since 1901

Dietz Machine Works
DIETZWORKS PHILA PA
MANUFACTURERS

TOILET ROLL CONVERTING MACHINES
TOWEL ROLL CONVERTERS
EMBOSSING EQUIPMENT
ANILINE PRINTERS
TOWEL INTERFOLDING MACHINES
ROTARY CARD CUTTERS
SLITTERS FOR VULCANIZED FIBRE

126-128 W. Fontaine St.
Sta. "O" Phila., Penna.

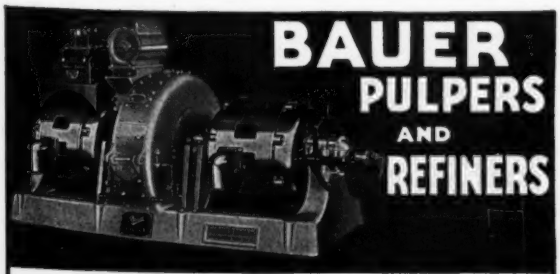
CASEIN

Uniform Quality

Dependable Service

Special Types to Meet Unusual Requirements

CASEIN COMPANY OF AMERICA
DIVISION OF THE BORDEN COMPANY
350 Madison Avenue, New York, N. Y.
Over 40 Years of Service to Users of Casein Products



BAUER PULPERS AND REFINERS

Double-Disc and Single-Disc Machines for stock preparation, semi-chemical, semi-sulphite and all reject refining. Write THE BAUER BROTHERS COMPANY, Springfield, Ohio

SCREENS of Perforated Metal

The Harrington & King Perforating Co.
5652 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N.Y.

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens..	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.50	@	2.75
Domestic	2.25	"	2.50
Wool Tares, light...	1.75	"	2.00
Wool Tares, heavy..	1.80	"	1.90
Bright Bagging.....	2.25	"	2.50
Manila Rope—			
Foreign	3.90	"	4.15
Domestic	3.75	"	4.00
Jute Threads.....	3.00	"	3.25
Sisal Strings.....	2.00	"	2.25
Mixed Strings.....	.70	"	.85

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.75	@	3.00
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1..	1.70	"	1.80
Soft White Extra..	2.25	"	2.40
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag....	1.00	"	1.10
Solid Flat Book...	.90	"	1.00
Crumbled No. 1...	.40	"	.45
Ledger White Stock.	1.55	"	1.65
Ledger Stock Colored	1.05	"	1.15
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.40	"	1.50
Old Kraft Machine— Compressed bales..	1.00	"	1.10
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue.	.70	"	.75
Strictly Folded....	.55	"	.60
Corrugated	.60	"	.65
No. 1 Mixed Paper..	.52½	"	.55

Twines

(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.18½	@	—
White Hemp.....	.18½	"	—
Fine Polished—			
Fine India.....	.23	"	—
Unpolished—			
Box	.14¾	"	—
Paper Makers.....	.15	"	—
Tube Rope.....	.16¼	"	—
Wall Paper.....	.15¾	"	—
Wrapping	.18	"	—
Soft Fiber Rope...	.16¼	"	—
Cotton	.21	"	—
(Hard Fiber)			
Medium Java.....	.19	"	—
Mex. Sisal.....	.16	"	—
Manila	.24	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

Shirt Cuttings—			
New White No. 1.	.07¼	@	.07½
New White, No. 2.	.04	"	.04½
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04½
Black Silesias, soft	—	"	.03¾
New Unbleached..	.05½	"	.06
Washable, No. 1..	—	"	.04
Blue Overall.....	—	"	.05
Cottons—According to grades—			
Washable No. 2...	—	"	.02
New Blue.....	—	"	.02
Fancy Percales....	—	"	.03
New Black Soft...	—	"	.04
New Light Seconds	.04½	"	.05
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.04
No. 2 Mixed.....	.03	"	.03¼
Corduroy	—	"	.02½
New Canvas.....	.05½	"	.06
New Black Mixed.	—	"	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	2.00	"	2.25
Repacked	2.50	"	2.75
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1.....Nominal			
Domestic No. 1...	1.50	"	1.60
Domestic No. 2...	1.35	"	1.45
Roofing Bagging..	—	"	1.30

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.50	@	3.00
Manila Rope.....	—	"	4.50
Sisal Rope.....	1.75	"	2.00
Mixed Rope.....	1.25	"	1.50
Scrap—			
No. 1.....	2.50	"	2.75
No. 2.....	—	"	1.40
Wool Tares, heavy..	3.50	"	3.70
Mixed Strings.....	.75	"	1.00
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	2.00	"	2.10
No. 1 Soft White..	1.85	"	1.90
No. 2 Soft White..	1.50	"	1.60
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.50	"	1.60
Ledger Stock, white.	1.30	"	1.35
Ledger Stock, colored	1.00	"	1.10
No. 1 Books, heavy..	.80	"	.90
Manila Cuttings.....	1.90	"	2.00
Print Manila.....	.70	"	.75
Container Manila....	.65	"	.70
Kraft Paper.....	1.00	"	1.10
No. 1 Mixed Paper..	.55	"	—
Straw Board Chip...	.50	"	—
Binders Board Chip..	.50	"	—
Corrugated Board...	.60	"	.65
Overissue News.....	.70	"	.75
Old Newspapers.....	.65	"	.70

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White.	1.85	"	2.15
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.30	"	—
Overisue Ledger Stock	1.30	"	1.50
Mixed Ledgers.....	.85	"	.90
No. 1 Books, heavy..	1.00	"	1.10
No. 1 Books, light...	.65	"	.75
Crumpled Stitchless Book Stock.....	.55	"	.65
Manila Env. Cuttings	1.70	"	1.85
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	1.10	"	1.20
Mixed Papers.....	.52½	"	.55
Print Manila.....	.70	"	.75
Container Manila....	.60	"	.70
Old Newspapers.....	.60	"	.65
Paper Wool Strings.	.80	"	.90
Overissue News.....	.70	"	.75
Box Board Chips....	.52½	"	.55
Corrugated boxes....	.60	"	.65
Kraft corrugated boxes	1.10	"	1.20
Screening Wrappers.	.60	"	.70

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	4.25	@	4.50
Domestic	4.00	@	4.50
Sisal Rope	2.25	"	2.50
Mixed Rope.....	.75	"	1.00
Transmission Rope..	3.00	"	—
Soft Jute Rope.....	2.60	"	2.85
Jute Carpet Threads.	1.25	"	1.50
Gunny Bagging—			
Foreign	2.50	"	—
Domestic	2.10	"	2.25
Bleachery Burlap....	3.00	"	3.50
Scrap Burlap—			
Foreign	2.25	"	2.40
Domestic	1.85	"	1.90
Scrap Sisal.....	2.25	"	2.35
Scrap Sisal for Shredding	2.50	"	2.60
Wool Tares, Heavy..	2.40	"	2.50
New Burlap Cuttings	2.35	"	2.50
Aust. Wool Pouches.	3.00	"	3.25
Heavy baling bagging	2.60	"	2.65
Paper Mill Bagging..	1.25	"	1.50
No. 2 Bagging.....	1.10	"	1.25

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1...	.08	"	.08¼
New Light Flannelettes	.05	"	—
Silesias No. 1.....	.05	"	—
New Black Silesias..	.03½	"	.03¾
Soft Unbleached.....	7.50	"	8.00
Blue Cheviots.....	.05½	"	.06
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to grades—			
Blue Overalls.....	.05¼	"	.05½
New Black, soft...	.03¼	@	.04
Khaki Cuttings.....	.02½	"	.03
O. D. Khaki.....	.03	"	.03¼
Corduroy	.02¾	"	.03
New Canvas.....	.06¾	"	.07¼
B. V. D. Cuttings...	.07	"	.07½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04¼	@	—
White No. 1—			
Repacked	—	"	2.75
Miscellaneous	2.50	"	2.75
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.25	"	2.50
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.50	"	1.60
Black Stockings.....	4.00	"	4.25
Roofing Stock—			
No. 1.....	1.75	"	2.00
No. 2.....	1.60	"	1.65
No. 3.....	1.00	"	1.25

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....(nominal)	
Dutch Blues.....(nominal)	
New Checks and Blues(nominal)	
Old Fustians.....(nominal)	
Old Linsey Garments(nominal)	
New Silesias.....(nominal)	

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots.			
No. 1 White $35.50		@	—
No. 1 Tints	36.50	"	—
No. 2 White	25.50	"	—
No. 2 Tints	26.50	"	—
No. 2 Golden Rod..	27.50	"	—
No. 3 White	21.00	"	—
No. 4 White	15.00	"	—
No. 4 Tints	16.00	"	—
No. 4 Golden Rod..	17.00	"	—
Direct mill shipment in three-ton lots.			
No. 5 White $10.50		@	—
No. 5 Tints	11.50	"	—
No. 5 Golden Rod..	12.00	"	—
No. 6 White	9.00	"	—
No. 6 Tints	9.50	"	—
No. 6 Golden Rod..	11.00	"	—
No. 7 White	8.00	"	—
No. 7 Tints	8.50	"	—
No. 7 Golden Rod..	10.00	"	—
Book—			
No. 1 M. F.	$7.00	"	—
No. 2 M. F.	6.50	"	—
No. 3 M. F.	5.35	"	—
No. 1 S. C.	7.25	"	—
No. 2 S. C.	6.75	"	—
No. 3 S. C.	5.85	"	—

Coated Book & Litho

Ton Lots (resale)

No. 1.....$12.00		@	—
No. 2.....	10.25	"	—
No. 3.....	8.90	"	—
Coated tinted.....	13.00	"	—
Wrapping—delivered—			
Rag Brown.....	4.85	"	5.25
White Wrap.....	4.00	"	—
"B" Manila.....	4.90	"	6.15
No. 1 Manila.....	$5.50	@	$6.90
Fiber	5.50	"	6.90
Kraft No. 2.....	5.50	"	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..	46.00	"	—
Sheets	54.00	"	—

Pulp

Ground wood.....$33.00		@	36.00
Unbleached sulphite	44.00	"	—
Bleached sulphite...	54.00	"	—
Kraft	50.00	"	—
Soda	54.00	"	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.15	@	—
Soft White.....	2.00	"	2.15
White Blk. News..	1.35	"	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	"	1.00
Light and Crumpled Book Stock.	.80	"	.90
Ledgers and Writings	1.15	"	—
Manilas—			
New Manila Cut...	1.55	"	1.60
Printed Manilas...	.76	"	—
Kraft	1.15	"	—
News and Scrap—			
Strictly Overissue.	.75	"	—
Strictly Folded....	.70	"	—
No. 1 Mixed Paper..	.60	"	—

Canadian Newsprint Output Higher

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 20, 1939—While the operating ratio of Canadian newsprint mills in October was higher than in the previous month—77.5 percent as compared with 72.7 percent—it was due in large measure to resumption of shipments overseas, and is not regarded as indicating the possibility of a continuation of such increases. The production was at the highest figure attained on the present rise, and just about equalled that of October, 1938, when the highest peak was attained for that year.